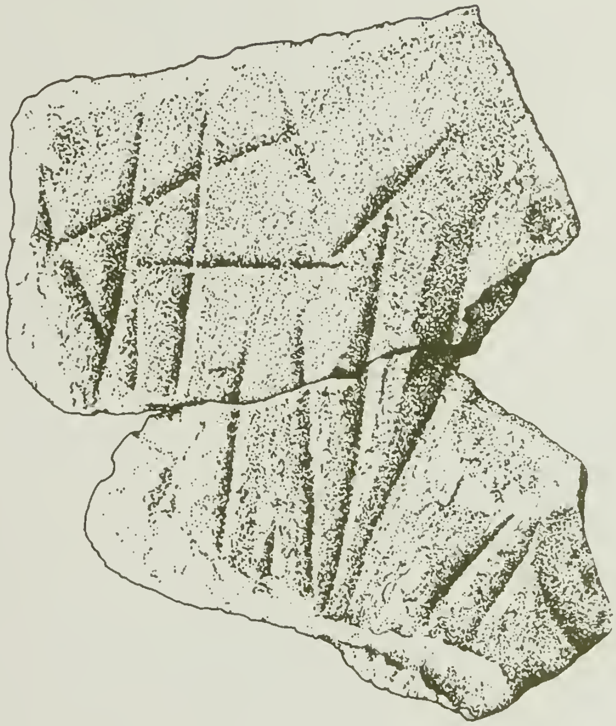
THE HARRIS SITE EXCAVATION



Bureau of Land Management
Colorado State Office

Gordon C. Tucker
and
The Colorado Archaeological Society

Cultural Resource Series
Number 28

Chipeta Chapter

THE HARRIS SITE
A MULTI-COMPONENT SITE OF THE UNCOMPAHGRE PLATEAU WEST-CENTRAL COLORADO

By

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and

Chipeta Chapter of the
Colorado Archaeological Society
Montrose, Colorado

Bureau of Land Management
Colorado State Office
Denver, Colorado

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FOREWORD

This volume represents a unique partnership of federal and private cooperation to excavate an archaeological site on public lands in Colorado. The Harris site is special not only from its scientific aspects, but also because it was found by an amateur archaeologist, Bill Harris, and was subsequently excavated by a group of dedicated amateurs from the Chipeta Chapter of the Colorado Archaeological Society (CAS) under the direction of Dr. Gordon Tucker.

What is significant about this publication is that it is the first joint CAS/BLM volume to be printed. It represents the best of amateur archaeology, and it adds to our body of knowledge about the past. This cooperation is a model for future projects between amateur groups and federal land management agencies. Projects like this help dispel the myth that all amateurs are vandals or pothunters. Nothing can be further from the truth as this excellent report proves.

I am very pleased and proud to share this high quality archaeology report with both the professional and amateur communities. I hope that everyone who reads this work enjoys it.

Tom Walker

Tom Walker
Acting State Director
Colorado

PREFACE

The Harris Site (5MN2341), a small rockshelter on the Uncompahgre Plateau near Olathe, Colorado, was sporadically utilized by prehistoric and historic occupants for nearly 3,500 years. You could say this occasional use continued into the latter decades of the twentieth century since members of the Chipeta Chapter of the Colorado Archaeological Society (CAS) and archaeologist Dr. Gordon Tucker spent countless weekends and hours between 1984 and 1988, mapping, photographing, testing, analyzing, and backfilling (including old looter pits) this rather unique site. Discovery and reporting of the Harris site is credited to Bill Harris, local Montrose resident, and then president of the local chapter of CAS. The project was authorized via federal permit C-46651(a), issued by BLM in 1987.

This site is unique both for its more or less continuous, but sporadic, prehistoric seasonal use, for several thousand years and for the stylized rock art and recent historic Ute occupation. Macrobotanical, pollen, and sedimentary evidence show that the local paleoenvironment fluctuated between cool/moist and war/dry conditions several times over the last 3,500-4,500 years. Faunal remains, more prevalent prior to 2,730 +/- 200 BP, indicate a heavier dependence on game, however, the presence of plant remains in all excavation levels shows processing of vegetal resources was also an important activity throughout occupation. As the climate warmed, there was a continual decrease in the availability of food, water, and fuel resources.

The abundant rock art on the cliff face behind the site is representative of the Uncompahgre style rock art and since fragments of incised, abstract portions of this art were recovered from dated excavation levels, we now suggest pushing the temporal span of this style back at least another 1,600 years.

Finally, a limited number of diagnostic historic artifacts indicate a small party of Indians, probably Utes, camped at the site sometime between mid-1879 and the end of 1881.

This is a special site. Our thanks go to the many volunteers, contributors, and Dr. Gordon Tucker who all worked on this project. I hope you enjoy this volume as much as I did.

Richard E. Fike
District Archaeologist
Montrose District
August, 1989

ABSTRACT

The Harris Site (5MN2341) is a multicomponent site, located at the lower (eastern) edge of the Uncompahgre Plateau in Montrose County, Colorado, on lands managed by the Bureau of Land Management (BLM). The site consists of a rockshelter with deep, stratified deposits; six rock art panels on the cliff face behind the shelter; and, a light scatter of artifacts in front of the shelter and on the opposite (south) side of a shallow, intermittent drainage. The rockshelter was extensively vandalized by unknown persons prior to, or during, 1984. In an effort to salvage information from the site before it was further vandalized, the Chipeta Chapter of the Colorado Archaeological Society (CAS) recorded the site and the rock art, mapped the surface manifestations, and conducted limited test excavations between 1984 and 1987. From these efforts, over 6,700 artifacts were collected from the surface and the excavation units, three radiocarbon age estimates were obtained from the buried deposits, and a wealth of ecofactual information was recovered. These data have shown that the Harris Site was first occupied by archaic peoples about 3,500 years ago, during a time when the climate was slightly cooler and moister. Aboriginal peoples occupied the site on a seasonal basis (probably spring and fall) for millennia. During this long period of occupation, the local climate fluctuated between warm/dry and cool/moist conditions. The site inhabitants pursued a broad spectrum pattern of hunting and gathering, exploiting native plants and animals. This

pattern was relatively stable over a long period of time. The most recent inhabitants of the site were a small party of horse-mounted Utes who stayed for only a short period of time. On the basis of the evidence gathered so far, the Harris Site is considered to be eligible for nomination to the National Register of Historic Places. Further work at the site is planned to answer questions generated by the completed investigations. It is recommended that the BLM implement measures to protect the site from further destruction.

ACKNOWLEDGEMENTS

A grateful mind/By owing owes not,
but still pays, at once/Indebted and discharged.
--MILTON, Paradise Lost (1667)

This report is the product of many hands and many minds. It can truthfully be said that work at the Harris Site, and this report, would not have been completed without the help of many people. I would like to take this opportunity to single out these people for special mention.

First of all, I would like to thank my family - Kathy, Jessica, Christopher, and Jonathan - for their forbearance as I spent many hours working at the site, analyzing the results, and writing this report. They were my rock to which I clung when this project did not progress as I wished. They share with me any kudos, and none of the blame, which may ensue from this work.

Bill Harris rightfully deserves to be mentioned next. Bill found the site, he has been a stalwart member of the field and laboratory crews, he has devoted several hours discussing the results with me, and he has generally been a good friend for the last six years. I think that the success of this project is in no small measure a result of his energy and perseverance.

The completion of this report, and its attractive appearance, is largely due to the efforts of Linda Delman. She invested a lot of time and energy in typing several drafts of the document, and I am extremely grateful to her for her dedication. Final typing and printing of the document were done at the Powers Elevation Co., Inc. (PEC) office in Aurora, Colorado by Colleen Lark and Connie Frailey. I would like to thank them, especially Connie, for helping me over this final hurdle, and to Marcia Tate, PEC Archaeology Department Manager, for use of PEC computer equipment. Thanks, too, to Bill Tate for printing the photos used in the report, and for drawing the cover illustration.

Nancy Lamm drafted the site map and drew all of the artifact illustrations. Her skillful renderings have greatly enhanced the quality of the report. I thank Chuck Bromley for putting together on his Macintosh computer several of the sketches that I used in the research proposal.

I would like to pay tribute to a great bunch of people: 19 members of the CAS Chipeta Chapter, who endured both heat and subfreezing temperatures to record, map, and test the site, and who spent long evenings cataloguing and describing the artifacts. Some were more regular participants in these endeavors, but all contributed to a greater or lesser degree to the overall success of the project. These individuals are the following:

John & Betty Anderson
Chuck & Barb Bromley
Don & Bev Davis
Linda Delman
Jim Fisher
Bobbi Gill
Bill Harris
Jon Horn
Madeline Kernen
Hal & Sharon Manhart
Chuck & Marie Martin
Carlyle "Squint" Moore
Bertha Mullikin
Bernie Witler

I would also like to thank the collective membership of the Chipeta Chapter for their support of the Harris Site project, and for their enthusiastic willingness to fund the work. I can hardly begin to express my appreciation to the anonymous person who donated $200 for radiocarbon dating. His/her gift was invaluable.

I am deeply grateful to my colleagues who volunteered to study the ancillary specimens: Sally Cole, Nancy Lamm, Jon Horn, Meredith Matthews, Linda Scott Cummings, and Ron Rood. Their contributions have individually and collectively transformed what might otherwise have been a simple "site report" into a valuable research monograph. I hope the final product does justice to their contributions.

I appreciate the advice and assistance that BLM archaeologists Max Witkind and Kristi Arrington gave me during the preparation of the project research proposal. Max was particularly helpful in guiding me through the bureaucratic maze.

Finally, I would like to thank Bill Harris, Jon Horn, and Mary Ramaley for kindly reading all or portions of the manuscript, and offering trenchant comments on my interpretations, and my prose. I may not have heeded their advice in all instances, but I gave it much thought. Of course, none of these people are responsible for any shortcomings the final product may have. Such foibles are solely my own.

PROLOGUE

(ca. 1800 B.C.) . . . The hunters topped the crest of the hill and looked down into the small, narrow canyon. It was good to be home: the men had been gone for three days, hunting game on the upper reaches of the broad plateau to the west. It had not been a good hunt: they had seen only two deer, and they had not gotten close enough to the animals to throw their stone dart-tipped spears. Fortunately, they had caught a few rabbits which would provide enough meat for several days. As they approached the small rockshelter which their clan was occupying, they were hailed by their wives and children. The women had gathered various greens which they would cook with the rabbits in the large, pitch-sealed baskets to make a meager, but satisfying meal. The men noticed that the Old Man had been hard at work on the back wall of the shelter incising shallow grooves into the soft sandstone rock with a sharp flake of stone. He was very intent on recounting the recent history of the clan before he joined his ancestors in the Great Beyond. He had accomplished much in the last several months, as the entire back wall of the shelter, and two or three other flat spots on the canyon wall a few yards downstream, were covered by symbols. After their repast, the clan headman spoke once again on the subject which was uppermost on their minds: the possibility that they might have to move to another location. Each year, the climate was a little warmer, and it was having a drastic effect upon their way of life: game animals were becoming increasingly more difficult to find, edible greens were getting scarcer, and the seep on which they depended for water was diminishing its flow. They had talked to other clans who told them that there was good water and game to the south and west. They needed to decide soon where they were going and when . . .

(c.a. A.D. 1880) . . . The three men slowly rode their horses up the small, narrow canyon. Suddenly, a deer bounded out of the brush directly ahead of them. The men were surprised, but one quickly raised his rifle and fired a shot at the fleeing animal. Unfortunately, his aim was off, and the deer escaped unharmed. The spent cartridge dropped to the ground next to a small tree. Because it was dusk, and they were tired, the men decided to camp for the night on the flat bench next to the small dry drainage. They started a fire and ate some of the food they had brought with them: dried meat and several cans of fruit which the white trader at the Indian agency had given them. One of the men ate the fruit out of the can with a large, metal spoon which he had obtained from the trading post. After the meal, the leader worked on his Spanish-style bridle which had broken during the day: he discarded the broken metal piece and replaced it with a length of horsehair. The other two men walked across the drainage and up the short slope to a small rockshelter. They noticed incised symbols on the back wall, recognizing them as marks which they had seen on other rock surfaces throughout the region in which they roamed. They attributed their manufacture to the Ancient Ones who had lived here before them. They attempted to imitate some of the grooves, and added some of their own design, including a horse figure and a picture of a white man. As they walked back in the deepening gloom to their campsite, a tie on one man's moccasin broke, spilling several dozen brightly colored glass beads unnoticed on the ground. Around the campfire, before going to sleep, they discussed the changes that were happening to their tribe: the slowly increasing hordes of white men, and the talk that they might be moved to a reservation in Utah, to the north and west. These thoughts made them uneasy . . .

The above scenarios are speculative, of course. The main elements of each, however, are based upon actual data: that gathered by recent excavations at the Harris Site in Montrose County, Colorado. The following report describes these investigations.

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I

INTRODUCTION

This report describes the results of archaeological investigations at the Harris Site (5MN2341), Montrose County, Colorado. These investigations were conducted on a sporadic basis by the Chipeta Chapter of the Colorado Archaeological Society (CAS) from 1984 to 1987. The results shed new light on the prehistory and ethnohistory of the Uncompahgre Plateau and West-Central Colorado. They also serve as a nucleus out of which future investigations at the site can grow.

Project Background

In April, 1984, Bill Harris, a Montrose resident and then President of the CAS Chipeta Chapter, located an archaeological site in an unnamed canyon west of Olathe, Colorado. The site is a rockshelter, along whose back wall and adjacent rock faces are found distinctive rock art. Vandals had excavated a large pit directly underneath the rock overhang which forms the shelter. Inspection of the side walls of this pit revealed that the site may originally have contained substantial cultural deposits, of at least one meter depth; some of these deposits appeared to be still intact. Numerous fragments of chipped stone and groundstone littered the ground surface around the pit, suggesting that the looters were searching for collectable, whole artifacts and discarding fragmentary pieces. This reprehensible act of vandalism had at least one positive result: it provided an opportunity for the Chipeta Chapter to make a significant contribution to archaeological research in the region.

Shortly after its discovery, Chipeta Chapter members visited the site to record, map, and photograph the cultural evidence. Completed Colorado Cultural Resource Survey Inventory Record and Archaeological Component forms, accompanied by maps and photographs, were sent to the Office of Archaeological and Historic Preservation, Colorado Historical Society. Copies of these forms were also delivered to the BLM District Office in Montrose, under whose jurisdiction the site fell. The site was designated 5MN2341 and named the Harris Site, in honor of its discoverer. In September and November of 1984, several Chipeta Chapter members returned to document the site's unique rock art. This information was recorded on Rock Art Panel Supplements to the inventory record forms.

After these initial investigations, Chipeta Chapter members and BLM personnel continued to monitor the site. Additional digging was observed on at least two occasions, but the vandals were neither seen nor caught in the act of digging. In view of this ongoing vandalism, and the research potential evident in the site's cultural deposits, a research proposal was written which outlined a plan to mitigate the impact of the vandalism and to gather additional scientific evidence from the remaining deposits. This research proposal (Chipeta Chapter 1987) was submitted to the BLM in July 1987, and an application for a Cultural Resource Permit was submitted to the BLM in November 1987. After reviewing the research proposal and permit application, the BLM issued Permit C-46651a to Dr. Gordon C. Tucker, Jr. on November 15, 1987 allowing the Chipeta Chapter to conduct survey and limited testing at the Harris Site. A Fieldwork Authorization Request was submitted to and approved by the BLM Montrose District Office on November 17, 1987.

Chipeta Chapter members returned to the site over a period of about 6-7 weeks during the late fall and early winter of 1987 and 1988 to map the site and conduct test excavations. This work was completed on January 2, 1988. Frozen ground prevented the test units from being backfilled until March 1988.

All collected artifacts, ancillary study samples, and records were returned to Montrose where a lab had been established in the home of one of the Chipeta Chapter members. All artifacts were cleaned, catalogued, and appropriately labelled by Chapter members over a period of several weeks. The majority of the debitage, and the groundstone, were counted, measured, and described by Chapter members. The remaining debitage and chipped stone tools were examined by Dr. Tucker. The ancillary study samples were catalogued and then shipped to designated specialists for analysis. All materials collected from the Harris Site will be curated at the Anasazi Heritage Center in Dolores, Colorado.

Project Location and Description

The Harris Site is located in Montrose County, on the western edge of the Uncompahgre Valley, about 11 km (7 mi) southwest of Olathe, Colorado (Figure 1). Its legal location is the NE1/4 of the SW1/4 of Section 34, Township 50 North, Range 11

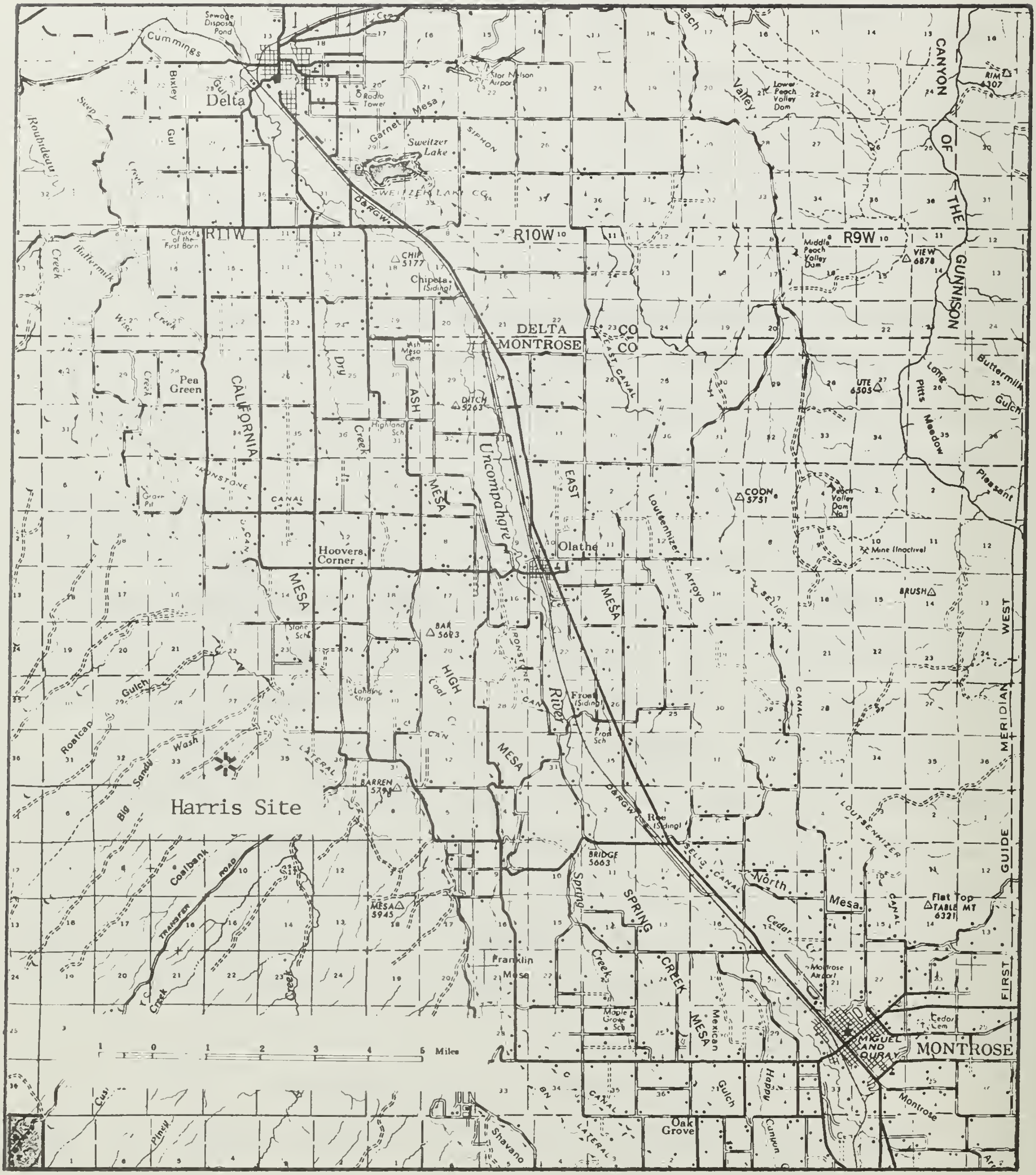


Figure 1. Regional map showing general location of the Harris Site (Source map: USDA Forest Service, Uncompahgre National Forest, Colorado Travel Map).

West, New Mexico Principal Meridian (Figure 2). It is on public lands that are administered by the BLM. Its elevation is approximately 1768 m (5800 ft) above sea level.

The Harris Site is a rockshelter with associated rock art, situated on the north side of a narrow, unnamed canyon (Figure 3). It is several meters above a shallow, intermittent drainage which flows north and east into Big Sandy Wash. The shelter is a shallow alcove, eroded by fluvial action and exfoliation of the Dakota sandstone. It measures approximately 16 m (52 ft) long, 3.5 m (11 ft) deep from the back wall to the dripline, and 2.5 m (8 ft) high from the roof at the dripline to the original ground surface; it faces southeast (Figure 4).

Distinctive rock art is found on the back wall of the shelter, and on rock faces to the east. Six individual panels have been identified, each with their own arrangement of elements, but sharing similar configurations of mostly abstract, incised lines. This rock art is described in detail by Sally Cole (Appendix A).

Vandals have excavated a large (5 m x 3 m x 1 m) oval-shaped pit in the central portion of the shelter (Figure 4). Two large backdirt piles are located on the slope in front of the shelter, indicating that all excavated materials were screened. The pit has exposed the shelter's internal deposits of alternating layers of dark, charcoal-enriched soil separated by clean, light brown sand. They extend as deep as the bottom of the pit (i.e. about 1 m) and probably continue deeper. The site stratigraphy, as revealed by the test excavations, is described in detail by

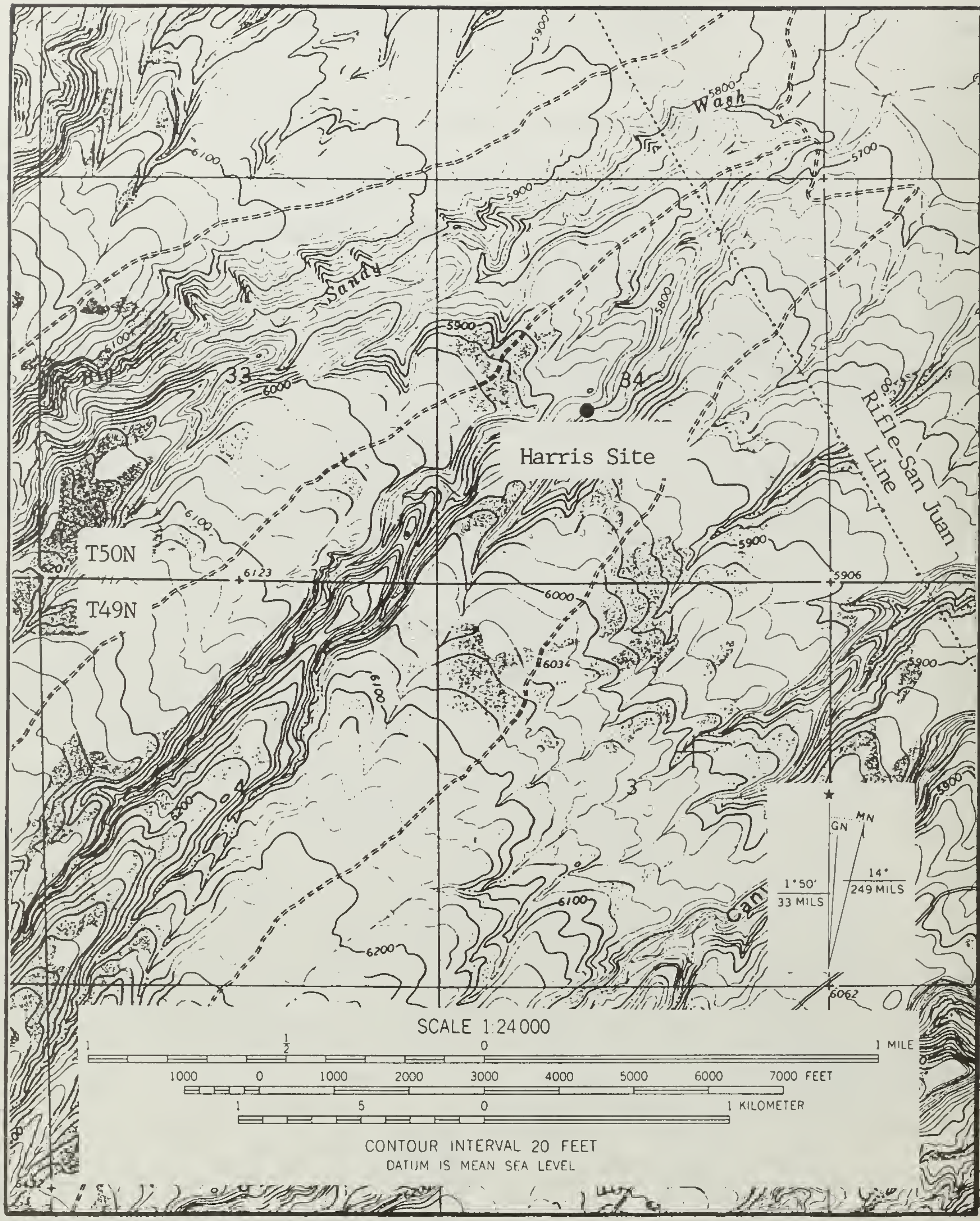


Figure 2. Topographic map of the area surrounding the Harris Site (Source map: Hoover's Corner, Colo. 7.5' USGS quadrangle 1962).

Figure 3. View of the Harris Site from opposite side of the canyon. The shelter is at left center, and rock art continues to the right along the rock face.

Figure 4. Closeup view of shelter at the Harris Site showing the vandal's pit. Note collection of broken manos on sandstone slab in foreground.

Nancy Lamm (Appendix B), and interpreted in relationship to the cultural materials in Chapter 6.

Numerous fragments of groundstone (manos and metates) and chipped stone (flakes and tool fragments) surround the pit, obviously discarded by the vandals after removal from the ground. A light scatter of mostly chipped stone artifacts extends out from the shelter to the east and west, and is slightly denser on the south side of the drainage. All of these surface artifacts were collected; they are described further in Chapter 6. The alluvial bench on the south side of the drainage is characterized not only by a slightly denser assemblage of chipped stone artifacts, but also by a small, but important collection of historic artifacts, including glass seed beads, cans, a metal spoon, and a rifle cartridge, probably left at the site by a small party of Utes. Jonathan Horn describes these items, and their significance to the site's occupational history, in Appendix C.

Project Objectives

The immediate and paramount objective of the initial investigations at the Harris Site was to salvage enough information from the remaining deposits to interpret its occupational history before it could be further damaged or destroyed. Beyond these mundane goals, however, these investigations offered an opportunity to gather evidence pertaining to the regional culture history and local paleoenvironmental conditions. This information could then be used as a nucleus from which additional work could be planned and implemented. Given the limited areal extent of the investigations, it was necessary to extract or "squeeze" as much information out of the collected data as possible.

A tertiary, though no less important, goal of the work at the Harris Site was to provide training in survey, recording, mapping, and excavating techniques for members of the Chipeta Chapter. Under professional supervision, these avocational archaeologists learned valuable lessons in archaeological methods, and gained a greater appreciation for the fragile and finite nature of cultural resources.

Thus, the Harris Site investigations were primarily salvage-oriented. They had, in addition, scientific and educational goals of nearly equal importance. Chapter 4 describes in more detail the research design which guided the investigations at the Harris Site. Therein are given the specific project objectives and problem domains.

The next three sections discuss the field methods (Chapter 5), the results of the investigations (Chapter 6), and the conclusions derived from these results (Chapter 7). Chapter 8 examines the effects that the controlled (Chipeta Chapter) and uncontrolled (vandals) excavations have had upon the integrity of the site. Measures to protect the site from further damage are proposed, and recommendations for further scientific investigations are made.

Before all of these interpretations and conclusions can be drawn, however, the environmental and cultural contexts of the site must be examined. Chapter 2 describes the effective environment of the local area, including both the modern environment and interpretations of past environmental conditions. Chapter 3 then summarizes briefly the archaeological investigations that have been conducted in the vicinity of the Harris Site, and discusses the conclusions these studies have derived concerning the regional cultural history. These conclusions are germane to a more complete understanding of the occupational history of the Harris Site.

II

EFFECTIVE ENVIRONMENT

The effective environment is the natural milieu to which all human populations must adapt. For the archaeologist, an understanding of both the modern environment and past environmental conditions is needed to interpret more completely how prehistoric populations adapted to their local environment. Knowledge of the present environment clarifies where prehistoric resources may be located. Against this known suite of variables, interpretations of the prehistoric environment -- as derived from physical evidence collected from a site's deposits --can be evaluated for their accuracy and significance.

Present Environment

Physiography and Geology

The Harris Site lies on the eastern flank of the Uncompahgre Plateau, a twice-uplifted block of Precambrian rocks overlain by Mesozoic sedimentary layers (Chronic 1980:305), in the Canyonlands section of the Colorado Plateau physiographic province (Fenneman 1931). The area is generally underlain by the locally undifferentiated Cretaceous-age Dakota Sandstone and Burro Canyon Formation (Williams 1964). The former is a yellowish brown and grey quartzitic and conglomeratic sandstone with interbedded grey to black carbonaceous nonmarine shale, while the latter is a white, grey, and light brown fluvial sandstone and conglomerate interbedded with siltstone, shale, mudstone and limestone.

The site is located on the north side of a small, unnamed canyon, along the bottom of which is the bouldery bed of a shallow intermittent drainage. This drainage flows northeasterly, eventually joining Big Sandy Wash about 1.6 km (1 mi) downstream from the site (Figure 2). Drainage in the latter is also intermittent and flows east into Dry Creek, the perennial water source closest to the site. Dry Creek flows north along the west side of the Uncompahgre Valley and joins the Uncompahgre River just south of Delta (Figure 1). Though permanent water sources are relatively distant, runoff does collect in potholes and catch basins near the site.

The geology, hydrology, and Quarternary history of the Harris Site and its immediate environs are discussed in greater detail by Nancy Lamm in Appendix B.

<u>Flora and Fauna</u>

The site is situated on the edge of the pinyon juniper vegetative community (REA 1983:Figure 4-5). This community is dominated by pinyon pine and Utah juniper, with an understory that contains such grasses as bottlebrush squirreltail, Indian ricegrass, and needle-and-thread (REA 1983:4-10). Interspersed with the pinyon-juniper woodlands are open sagebrush areas containing big sagebrush, black sagebrush and rabbitbrush (REA 1983:4-10). The Harris Site is also located within a short distance of at least three other major vegetative communities (REA 1983:4-10, 4-11, Figure 4-5): mountain shrub (Gamble oak, common serviceberry, and mountain mahogany), saltbush and greasewood (shadscale, saltbush, rabbitbrush, greasewood, broom snakeweed, and sagebrush), and riparian (cottonwood).

Fauna are abundant in the region. The site is located within the critical winter range of mule deer and elk (REA 1983:Figure 4-6), both of these large mammals are common and widely distributed throughout the area. The winter range of mule deer occurs at elevations below 2134 m (7000 ft) and they summer at elevations from 2377-4267 m (7800-14000 ft); spring-fall migration routes between these ranges occur at elevations from 1981-2438 m (6500-8000 ft) (REA 1983:4-13 and 4-14). The winter range of the elk is at elevations between 1981-2926 m (6500-9600 ft), their summer range coinciding with that of the mule deer (2377-4267 m or 7800-14000 ft), and their spring-fall range occurring between 2286-2438 m (7500-8000 ft) elevations (REA 1983:4-14). The ranges of bighorn sheep and mountain goat are restricted and usually found in the mountainous ranges south and east of the Harris Site. Pronghorn are common, but their ranges are limited; the closest herds are presently found near Delta, Colorado (REA 1983:Figure 4-6). Mountain lion and black bear are common to the area, as are several small mammals, such as rodents, lagomorphs, and carnivores (REA 1983:4-15). Raptors, gallinaceous birds (turkeys, quail, pheasant, chukars and grouse), waterfowl, and songbirds are abundant (REA 1983:4-16 to 4-18). Several species of reptiles and amphibians occur in the area and most of the streams contain several types of fish (REA 1983:4-18).

Climate

Weather patterns in the western valleys of Colorado are relatively uniform throughout the year (Siemer 1977). This area generally experiences high summer temperatures, while average winter temperatures are slightly lower than at similar elevations in the eastern plains. Precipitation is evenly distributed throughout the year, the winter months usually receiving the greatest amount of precipitation; June is the driest month. The Montrose No. 2 weather station, at nearly the same elevation (1777 m or 5830 ft) as the Harris Site, has recorded over an 80-year period an average annual temperature of 9.2°C (48.5°F); the warmest and coldest months are July and January. The average total yearly precipitation recorded at Montrose No. 2 station (84 years of record) is 246 mm (9.7 in), the wettest months being August, September, and October. The yearly snowfall averages 787 mm (31 in). The growing season -- the length of time between the last freeze in the spring and the first freeze in the fall -- at a threshold temperature of 0°C (32°F), is about 150 days.

Past Environmental Conditions

A model of regional paleoenvironmental conditions for the last seven millennia in west-central Colorado has been constructed by Horn et al. (1987). They used geological and pollen data collected from the Indian Creek Site (5ME1373), in combination with paleoenvironmental information from other localities in the region, to formulate this model. The Indian Creek Site is located about 55 km (35 mi) northwest of the Harris Site, near the town of Whitewater, Colorado. Their model is included here as Figure 5. It shows that the regional paleoclimate has fluctuated between warm/dry conditions and cool/moist conditions several times during the last 7000 years. Maximum warmth and dryness occurred between about 5000 B.C. and 3500 B.C., during the Altithermal climatic period. The severity of the succeeding climatic periods, warm/dry or cool/moist, and their effects upon the lifeways of the prehistoric inhabitants have yet to be deduced.

Summary

The Harris Site is uniquely situated where its prehistoric occupants could take advantage of a wide variety of natural resources. Nearby geological formations undoubtedly provided the raw materials for chipped stone and groundstone tools. Abundant floral and faunal resources were available within a few kilometers of the site. Water may have been a more spatially restricted commodity: permanent water sources such as Dry Creek and the Uncompahgre River certainly contained enough water for all of the needs of the prehistoric inhabitants, but they lie at some distance from the site. It is more likely that the site inhabitants relied upon nearby springs or seeps: groundwater percolates through the permeable Dakota sandstone and emerges as a seep at its contact with the underlying Mancos shale (see Appendix B). The local climate is warm and dry, and it is relatively uniform throughout the year. The site's southeast exposure would permit it to be occupied even during the winter; the overhang shades the shelter from the hot summer sun.

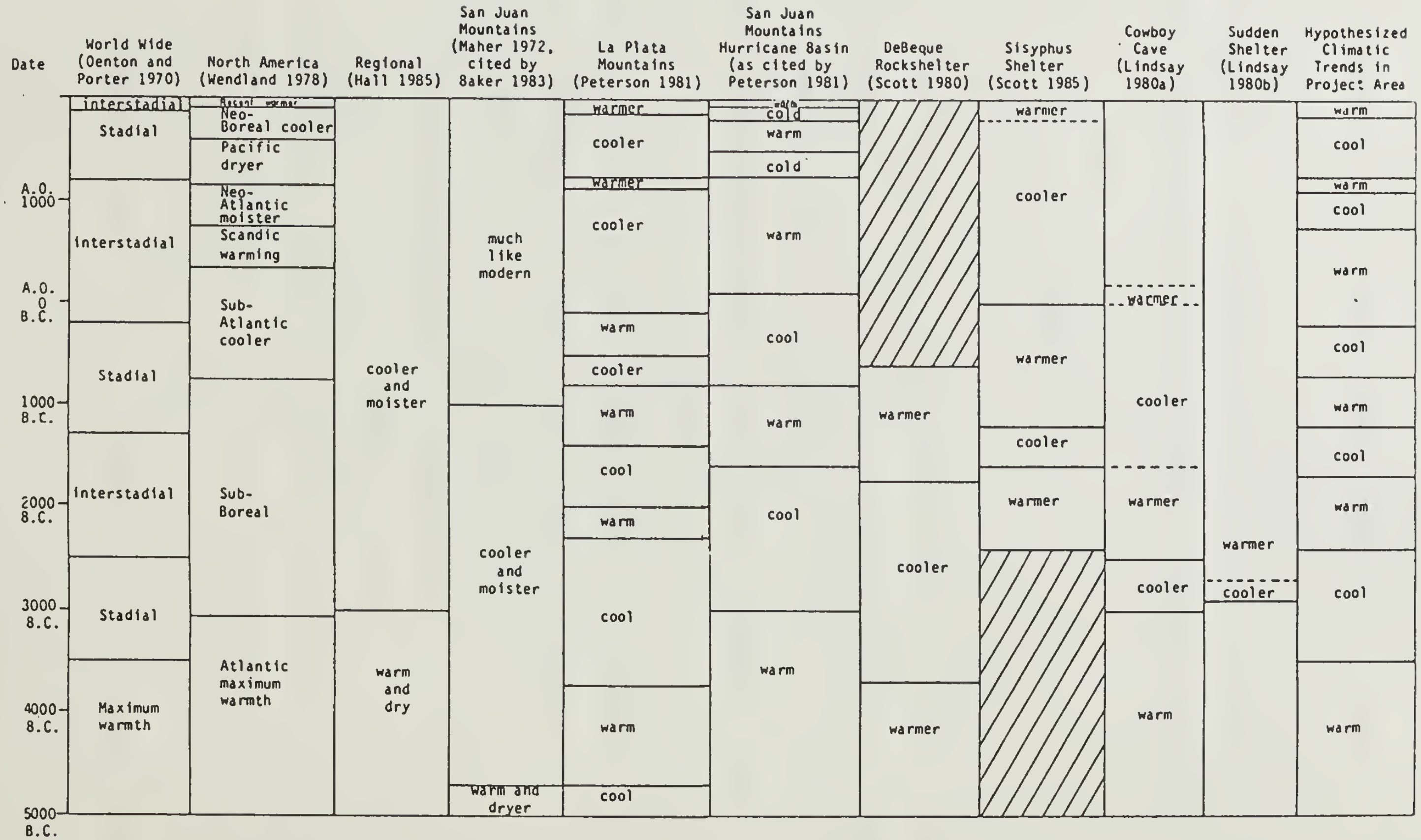


Figure 5. Regional paleoenvironmental models. The Indian Creek Site is the last column. (from Horn et al. 1987: Figure 2.1).

The site locale may not have been as ideal for habitation at various times in the past, however. Environmental data from sites in the region indicate that the climate during at least the last 7,000 years has fluctuated between warm/dry and cool/moist conditions. Conditions of greater aridity at approximately 5000-3500 B.C., 2500-1500 B.C., 1000-500 B.C., and A.D. 0-800 may have precluded occupation. During these periods, however, short periods of climatic amelioration could have permitted reoccupation of the site. The environmental data are still too coarse-grained to say with much confidence exactly when sites in the area may or may not have been inhabited.

III

REVIEW OF REGIONAL CULTURE HISTORY

This section reviews briefly the known culture history of west-central Colorado. It describes first the major archaeological investigations which have been conducted in the region. Following that, the major cultural time periods are introduced, and the prehistoric lifeways characteristic of each are summarized. This information is derived principally from two documents: The Archaeological Resources of the Uncompahgre and Gunnison Resource Areas, West Central Colorado, by Alan D. Reed and Douglas D. Scott (1982) and West Central Colorado Prehistoric Context Regional Research Design, by Alan D. Reed (1984). This review will permit the Harris Site (5MN2341) to be placed within its proper cultural and historical context.

Previous Archaeological Investigations

Compared to other cultural regions, such as the American Southwest, archaeological research in west-central Colorado until very recently has been something of a sporadic and desultory endeavor. The most likely reason for this neglect is the absence of large, highly visible, and unique ruins that are characteristic of such well-known nearby locations as Mesa Verde and Hovenweep. The most ubiquitous cultural remains in the area are scatters of chipped stone artifacts, some of very large areal extent. The region is known, however, to have been occupied for millennia by aboriginal peoples who, for the most part, pursued a seasonally nomadic, hunting and gathering lifestyle.

Archaeological research in the region can, therefore, provide useful insights into the lifeways of non-sedentary cultures.

The history of archaeological investigations in the region can be divided into two major periods, Early and Recent. This approach is a slight modification of the scheme presented by Reed and Scott (1982). Characteristics and major investigations of each period are described below.

<u>Early Period (1922-1970)</u>

This relatively long period is distinguished primarily by the search for, and identification of, the region's cultural resources. Research was scholarly and problem-oriented; that is, it was devoted to the resolution of general problems in the regional culture history. Investigators chose the sites or areas they believed would provide the evidence they needed to solve specific problems, and scrutinized these localities intensively. Because these efforts were pioneering, and because of large gaps in the record (especially chronological), many of their conclusions were incomplete or simply wrong. Some interpretations, however, have endured the test of time and all were instrumental in laying the groundwork for modern studies.

W. C. McKern's study of rock art in Shavano Valley west of Montrose and along the Gunnison River near Delta in 1922 is generally recognized as the first formal investigation of the region's antiquities. This information was lost until 1977 when the original manuscript was found in the National Anthropological Archives at the Smithsonian Institution. It was subsequently published in the BLM Colorado Cultural Resources Series (McKern

1978). McKern's perceptions about regional rock art styles were quite astute given the time period, and many are still relevant.

Between 1939 and 1941, Betty and Harold Huscher travelled extensively throughout west-central Colorado, visiting and recording numerous archaeological sites. Unfortunately, most of the information they gathered is unpublished.

The Denver Museum of Natural History excavated several rock shelters in western Colorado and eastern Utah between 1937 and 1952. Two sites, the Moore and Casebier rock shelters, are located near the Harris Site. The results were used to define the "Uncompahgre Complex", an archaic (nomadic hunting and gathering) adaptation to the local area (Wormington and Lister 1956). This was the first major effort to summarize and explain the regional prehistory.

Finally, the most comprehensive archaeological work heretofore conducted in the area is the Ute Prehistory Project, conducted by the University of Colorado between 1961 and 1963. William G. Buckles (1971) described the results of this project in his doctoral dissertation. Though the project's major goal, that of tracing the origins of the Ute culture in the area, was not realized, Buckles was able to redefine the Uncompahgre Complex and establish a regional cultural sequence.

Lastly, a few areas to be inundated by the construction of reservoirs were inventoried prior to 1970. These areas include Crawford Reservoir (Wheat 1958), Blue Mesa Reservoir (Lister 1962), and Morrow and Crystal Reservoirs (Breternitz 1974; Buckles 1964).

Recent Period (1970-present)

Due to the enactment of legislation protecting cultural resources, and the exponential growth of energy exploration and exploitation, archaeological investigations in the region have burgeoned in the last decade. Such work is generally grouped under the name of Cultural Resources Management (CRM) since its primary goal is to protect cultural resources from disturbance or destruction. Thus, this research is generally not problem-oriented, being more "reactive" than "active" in its approach. Numerous archaeological sites have and are being discovered through CRM efforts, however, and understanding of the regional prehistory has been greatly enhanced.

Most of these projects have been surveys and clearances of areas to be affected by ground disturbing projects. Areas surveyed include: Ridgway Reservoir (Dallas Creek Project) in 1973 (Breternitz 1973; Carpenter and Stiger 1975; Baker 1978; and Buckles et al. 1986); Dominguez Reservoir in 1975 (Conner et al. 1975); the Fruitland Mesa Project in 1976 (Carpenter et al. 1976); Black Canyon of the Gunnison National Monument in 1973 and 1974 (Breternitz et al. 1974; Stiger and Carpenter 1980); the Curecanti Project, beginning in 1976 (Stiger 1977) and presently ongoing (Jones 1982, 1986); Gunnison Gorge in 1976 (Roebuck 1977); the BLM Uncompahgre Resource Area in 1976 (Martin 1977); the Blue Mesa/Lake City transmission line in 1975 (Applegarth 1975); the Orchard Valley Mine near Paonia in 1977 (Baker 1977); and the Rifle-San Juan Project, just recently completed by Nickens and Associates (Chandler and Eininger 1982; Howell et al.

1984; Reed and Nickens 1981). The latter involved intensive survey, site recordation, and mitigation of the right-of-way for the Colorado Ute Electric Association's proposed Rifle, Colorado to San Juan, New Mexico 345 kV transmission line. This project is particularly relevant to the present research since the corridor passes about 0.8 km (0.5 mi) east of the Harris Site (see Figure 2).

Only a few sites have been excavated in the area within the Recent Period. These include the testing of several sites in the Curecanti National Recreation Area along the Gunnison River (Euler and Stiger 1981; Jones 1982, 1986); excavation by Fort Lewis College of a lithic scatter near Cushman Creek west of Montrose (Riches and Tankersly 1980); excavation by the Colorado Department of Highways of the Zephyr Site at Cerro Summit east of Montrose (Indeck and Kihm 1981); test excavations at a small rockshelter (5ME217) in Cactus Park on the Uncompahgre Plateau (Lutz 1978); and mitigative data recovery at the Indian Creek Site near Whitewater (Horn et al. 1987).

Regional Culture History

The results of these archaeological investigations can be used to construct a cultural historical sequence for the region. Figure 6 presents a proposed cultural historical sequence for west-central Colorado; it is derived principally from Reed (1984), but other sources were used for the specific regional sequences. Interpreted lifeways for each cultural stage are briefly summarized below, this information drawn from Reed (1984), except where otherwise noted.

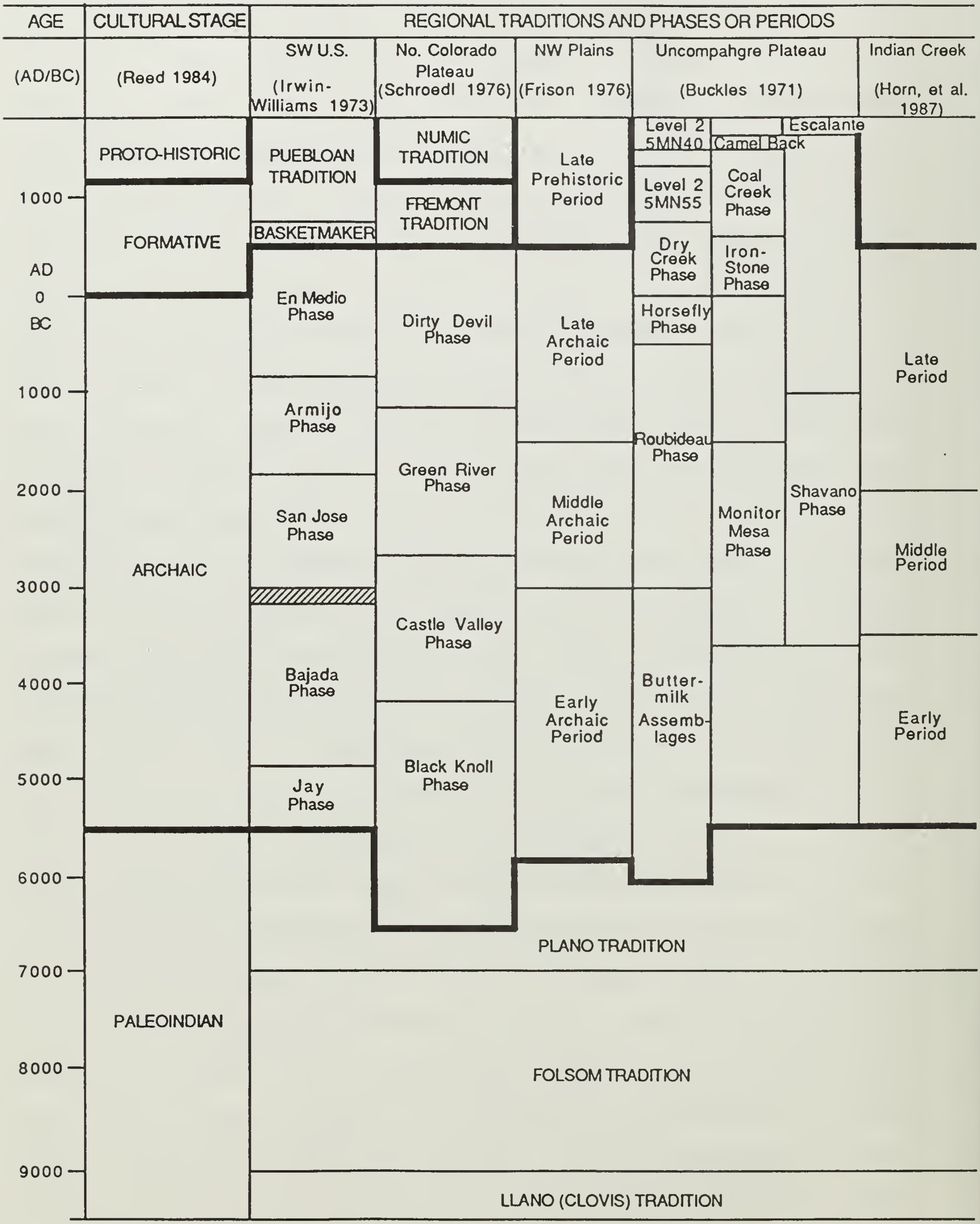


Figure 6. Cultural historical sequence for west-central Colorado.

Paleoindian Stage (ca. 10,000-5500 B.C.)

Evidence that Paleoindian peoples occupied west-central Colorado is extremely sparse. This evidence so far is limited to surface finds of distinctive projectile point types. From localities where Paleoindian remains are more abundant (such as southern Wyoming and eastern Colorado), researchers have deduced that the focus of Paleoindian economic activity was the hunting of large game animals, many of which are now extinct. Paleoindian bands were highly mobile, moving through an annual territory in pursuit of large game. Temporary shelters were probably built, and various vegetal resources were undoubtedly exploited, but no direct evidence of such practices has yet been found.

Three cultural traditions have been identified for the Paleoindian Stage, each characterized by distinctive lanceolate projectile points found in association with particular faunal species. The Llano Tradition (10,000-9000 B.C.) is characterized by the fluted Clovis point, found with the remains of extinct mammoth; the Folsom Tradition (9000-7000 B.C.) is distinguished by the fluted Folsom point, found in association with extinct forms of bison; and the Plano Tradition (7000- 5500 B.C.) is distinguished by several types of unfluted projectile points (e.g. Agate Basin, Eden, Midland, Plainview, and Scottsbluff), found in association with forms of modern fauna, such as pronghorn and bison.

As of 1984, a total of 38 Paleoindian projectile points had been reported in west-central Colorado; more than three-fourths of these are Plano varieties. Nearly all have been scattered surface finds, many concentrated near the Gunnison River between Cerro Summit and Gunnison. A few Plano Tradition projectile point types have been recovered from dated stratigraphic contexts in nearby sites.

The base of a Midland Point was found in Level 9B at the Christmas Rock Shelter (5DT2) on the Uncompahgre Plateau. Buckles (1971:1295) labeled Levels 9B through 11C of the Christmas Rock Shelter the Buttermilk Assemblages, tentatively assigning them a chronological age range of 8000-3000 B.C. He has recently obtained a radiocarbon age determination of 6650 ± 200 years B.P. for Level 9B (Buckles 1985). This date has a calibrated age range (Klein et al. 1982) of 5955-5220 B.C., thus confirming a late Plano age for this level. It would appear, however, that the duration of the Buttermilk Assemblages should be foreshortened by about two millennia.

Two projectile points were recovered from the Soderquist Ranch Site (5GN246), east of Cimarron, which resemble Late Paleoindian (Plano Tradition) types (Liestman and Gilmore 1988). A James Allen point was recovered from the contact of Levels IVb and V, while the base of a Hell Gap point was found at the contact between Levels IVa and V. A radiocarbon age estimate of 7670 ± 70 B.P. was obtained for Level IVb. It is believed that both projectile points are approximately contemporaneous and associated with a cultural occupation on top of Level V, which is older than 7670 ± 70 B.P.

Archaic Stage (5500 B.C.-A.D. 1)

The Archaic Stage represents a shift away from a reliance upon large game towards a more diversified economy that favored a more equitable exploitation of floral and faunal resources. The Archaic Stage in west-central Colorado was extraordinarily persistent, overlapping with the Paleoindian Stage and flourishing until European contact in historic times. Its longevity is perceived as a successful adaptation to a unique natural environment (Cassells 1983:91). Several chronological sequences for the Archaic Stage have been defined for the region and surrounding areas, and some or all may be pertinent to west-central Colorado. These include the Oshara Tradition of southwestern Colorado and northwestern New Mexico (Irwin-Williams 1973), the Archaic Tradition of the northern Colorado Plateau (Schroedl 1976), the Archaic Tradition of the northwestern Plains (Frison 1978), and the Uncompahgre Complex (Buckles 1971). The phase sequences for each of these regional traditions are identified in Figure 6.

Horn et al. (1987) advocate the adoption of a new spatial-temporal model, the Uncompahgre Technocomplex, for west-central Colorado. It, like its predecessor the Uncompahgre Complex, represents a cultural adaptation to a unique environmental, social, and technological situation. It is divided into three temporal periods based upon numerous radiocarbon age estimates reported from the northern Colorado Plateau: Early Period (5550-3550 B.C.), Middle Period (3500-2050 B.C.), and Late Period (2050 B.C.-A.D. 450) (Horn et al. 1987:138).

Previous research indicates that Archaic groups were highly mobile bands, moving throughout the year from one area to another as seasonal food resources became available. They probably set up base camps near these resources, staying there for up to several weeks, and established short-term campsites closer to the exploitable resources. The base camps were moved as these resources were depleted.

The annual subsistence round of Archaic groups in west-central Colorado was oriented along drainage systems and vertically configured; that is, these groups moved from lower to higher elevations, and back again, along drainages. Bands wintered along lower elevation valleys in the pinyon-juniper zone, moved into the higher elevations during the spring as the large game animals moved upslope and desirable plant resources became available, and returned to the lowland valleys as winter approached. Local groups timed their movements so as to coincide with the maturation and availability of desired resources.

The best evidence for Archaic cultures on the Uncompahgre Plateau, like the rest of Colorado, comes from rockshelters (Cassells 1983:77). These are desirable habitations since they provide protection from the elements and are warm in winter (if they face south) and cool in summer. The debris left behind by these inhabitants are well-protected and provide a detailed record of the regional culture history. Local examples of such sites include the Taylor, Alva, Christmas, Moore, and Casebier Shelters, and the Tabeguache Caves.

The material remains left behind by Archaic groups complement their nomadic lifestyle. Habitation structures are rarely found and, when they are, tend to be somewhat ephemeral. Architectural elements have been identified at one site along the Gunnison River in the Curecanti Natural Recreation Area (Blue Mesa Reservoir), possibly at site 5ME217 in Cactus Park on the Uncompahgre Plateau, at the Kewclaw and Sisyphus sites in the Colorado River Valley, and at the Indian Creek Site.

A charcoal-stained, shallow, oval basin, underlain by pole-impressed burned clay was uncovered at Site 5GN204/205 at Curecanti (Jones 1982). It returned radiocarbon assays of 4398±90 years B.P. (Tx-3157) and 4697±80 years B.P. (Tx-3151), which have respective calibrated age ranges (Klein, et al. 1982) of about 3370-2880 B.C. and 3775-3170 B.C., overlapping at ca. 3000 B.C., within the Middle Period of the Uncompahgre Technocomplex.

At site 5ME217 in Cactus Park, Lutz (1978) found a large (about 1-2 m in diameter) concentration (Feature 2) of rock, burnt wood, and charcoal which he believed was the remains of a temporary structure. A charcoal sample collected from the interior of Feature 2 returned a radiocarbon age estimate of 1690±55 years B.P. (DIC-973), which has a calibrated age range of A.D. 85-455 (Klein, et al. 1982). This age estimate places the occupation at the terminus of the Archaic Stage.

The Kewclaw Site is located on Battlement Mesa near the town of Parachute. It contains a shallow pit structure with an internal slab-covered fire hearth and at least eight postholes.

The posts probably supported a superstructure of wattle and daub construction. Radiocarbon ages of 2900±60 years B.P. (Beta-3339) and 2770±60 years B.P. (Beta-3840) were obtained from the structure. They have overlapping calibrated age ranges (Klein, et al. 1982) of 1330-885 B.C. and 1105-800 B.C., placing the construction and use of this structure within the Late Period of the Archaic.

At the Sisyphus Shelter near the town of Debeque, a rectangular slab-lined structure was exposed underneath a small rock overhang. A radiocarbon age estimate of 2410±70 years B.P. (DIC-1660), with a calibrated age range of 770-395 B.C. (Klein, et al. 1982), was obtained from this structure, thus placing its construction in the Late Period of the Archaic.

Finally, three features were exposed on Cultural Level 4 at the Indian Creek Site. Horn et al. (1987) believe that these are the remains of habitation structures. They are roughly circular, have irregular but well-defined edges, are saucer-shaped in cross-section with a maximum depth of about 25 cm, and measure approximately 3 m in diameter. A radiocarbon age estimate of 4560±470 years B.P., with a calibrated age range (Klein, et al. 1982) of 3895-2635 B.C., was obtained from Cultural Level 4. This evidence suggests that wickiup-like habitation structures were built at the Indian Creek Site during the Middle Period of the Archaic.

Artifacts commonly found on Archaic sites in the region include chipped stone (projectile points, knives, scrapers, drills, preforms, bifaces, and debitage) and groundstone (manos and grinding slabs). Bone, antler, and perishable items occasionally have been recovered from rock shelters. Archaic Stage sites in west-central Colorado are most often identified by the occurrence of distinctive projectile point types. These include large corner-notched points, large side-notched points, stemmed-indented base points, large side-notched indented base points, contracting stemmed points, and stemmed square-base points. These implements were probably attached to an atlatl-propelled dart. Small corner-notched points, which may have been attached to arrows, appear near the end of the Archaic Stage.

Formative Stage (A.D. 1-1300)

The Formative Stage is defined by "the presence of agriculture, or any other subsistence economy of comparable effectiveness, and by the successful integration of such an economy into well-established sedentary village life" (Willey and Phillips 1958:146). West-central Colorado lay outside, or on the periphery, of two major Formative Stage cultures: the Anasazi Tradition, located in southwestern Colorado and adjacent states of Utah, Arizona, and New Mexico; and the Fremont Tradition, located in Utah and northwestern Colorado (Cassells 1983:Figures 7-6 and 8-2). These groups farmed, typically growing corn, beans, and squash, and supplemented this diet of cultigens with wild foodstuffs; made pottery; and lived in permanent or semi-permanent habitations made of stone or jacal (mud and sticks), or dug into the ground (pithouses).

Sites with possible Anasazi or Fremont cultural affiliations are sparse in the area, and are generally located in western

Montrose County and in Mesa County near Grand Junction -- that is, in those areas that are closest to the edges of the Anasazi and Fremont territories. Formative Stage components in the area are recognized by the presence of one or more of the following attributes: cultigens, masonry habitation structures, and ceramics.

Remains of cultivated plants, mostly corn but some squash, have been found at about two-dozen sites in the region (Reed 1984:Table 2). This group includes Christmas Rock Shelter (5DT2) along Roubideau Creek north of the Harris Site where Fremont-type corn was found in Coal Creek Phase Level 3 (Buckles 1971:683). Squash remains have been recovered from Tabeguache Cave II.

Structural remains are slightly more abundant than cultigens, but the ranges of the two attributes overlap. The structures are primarily of two forms: rectangular and circular. The rectangular types are mostly found on the western slopes of the Uncompahgre Plateau, and may be Anasazi. The round structures are less common, found mostly on the eastern side of the Uncompahgre River along the lower Gunnison River; they may be of Fremont origins.

About 600 Formative Stage ceramic fragments have so far been found in the region (Reed 1984:Table 3). Approximately 85 percent of these are Anasazi, the remainder are Fremont types. There is some doubt, however, that these fragments have been properly classified (A. Reed, Personal Communication, December 1986).

Given the scarcity of these so-called culturally diagnostic attributes on sites in the region, and the fact that some of these "traits" have dubious validity, it is not surprising that many have questioned the idea that Fremont or Anasazi groups actually lived in the area. In fact, some researchers have even speculated that indigenous Archaic people may have adopted a Formative Stage lifestyle (D. Scott, cited in Reed 1984:39). They exchanged ceramics with their Anasazi and Fremont neighbors, and adopted some of their architectural styles. Much more data are needed to resolve these issues of cultural affiliations.

Proto-Historic Stage (A.D. 1300-1881)

The Formative Stage lifeway, locally developed or not, apparently disappeared in the region about A.D. 1300, to be replaced by an Archaic-like lifestyle. This stage persisted in the region until the arrival of Euroamerican peoples in the late nineteenth century. It is commonly assumed that the area was occupied during most if not all of this period by Numic-speaking Utes. Linguistic data have been used to estimate that ancestral Utes reached west-central Colorado between A.D. 1200 and 1400. Firm evidence of Ute occupation in the region, however, dates to the eighteenth century. Dendrochronological specimens obtained from wickiups at sites 5MN41 and 5MN42 on Monitor Mesa returned tree-ring dates of A.D. 1741, A.D. 1762, and A.D. 1763 (Buckles 1985).

Like their Archaic predecessors (or ancestors), the Utes pursued a nomadic, hunting and gathering lifestyle. Small bands moved through an annual territory exploiting seasonally available resources. Their artifact assemblages were similar to Archaic assemblages except that they relied on the bow and arrow rather than atlatl and dart, and manufactured a distinct variety of pottery known as Uncompahgre Brownware (Buckles 1971:504-552). Euroamerican influence is evident on later Ute sites by the presence of buttons, glass beads, metal projectile points, metal ornaments, and other trade goods. Adoption of the horse by the Utes increased their mobility and dramatically altered their social structure and lifestyle. Rock art depicting horses or horse-like figures, tipis, and other historic elements are quite common in the region.

Ute sites are difficult to identify because their artifactual assemblages resemble those of earlier cultures. Those that have been identified as Ute contain wickiups, Uncompahgre Brownware sherds, or Euroamerican trade items, or are associated with historic aboriginal rock art.

Summary of Regional Culture History

Archaeological investigations have been conducted in the region since the 1920s and continue to the present. The earliest research was problem-oriented, concerned mostly with finding cultural resources in the region that might answer general questions about the culture history. After 1970, archaeological research flourished and hundreds of sites were recorded. Much of this work, however, has been directed towards salvaging data before they are destroyed by ground-disturbance project than to addressing specific problem domains.

This research has demonstrated that the region has been occupied by aboriginal peoples for at least 10,000 years. The Archaic Stage is best represented in the area, and Proto-historic Ute sites may be nearly as abundant. Paleoindian remains are sparse, a circumstance that could be explained as much by post-occupational disturbance by natural processes as it could be by a low population density. Formative Stage sites are found close to Anasazi and Fremont territories, suggesting that one or the other of these cultural groups exerted some influence on the fringes of the region. An *in situ* development of a Formative lifestyle has also been proposed.

IV

RESEARCH DESIGN

Project Objectives

The archaeological investigations conducted at the Harris Site were salvage-oriented, intended to gather scientific information from the site before it was irrevocably damaged by vandals. A large portion of the site has already been destroyed, but some of the site's deposits appear to be still intact. We believed, then, that these remaining deposits could be sampled to ascertain what clues they held concerning the site occupation(s) and the regional prehistory.

The research reported here comprises the initial efforts of what we hope is a long-term program of archaeological inquiry at the Harris Site. Since it was pioneering, the principal objectives of this initial research were relatively simple:

(1) To mitigate past vandalism, and

(2) To characterize the history of the site's natural and cultural deposits.

These objectives could be accomplished by an intensive inventory and recordation of the site's surface manifestations and rock art, and by limited test excavations. Both activities, but particularly the latter, would provide data relevant to the resolution of several problem domains of regional significance, identified below. Moreover, this information would provide the nucleus of the future research efforts at the site.

Problem Domains

Given the limited nature of the initial investigations at the Harris Site, the problem domains which can be addressed by the data gathered from this research are necessarily few and generalized. In succeeding years, as more data are gathered, the research questions can be more focused and specific. The background for each problem domain is briefly examined, high-lighting its relevance to the regional culture history. The kinds of data needed to address each problem domain are then enumerated.

Problem Domain 1: Refinement of Local Chronology

The cultural chronology of the Uncompahgre Plateau is not well-established. The chronological sequence currently in use in the area is that devised by Buckles (1971). However, as pointed out by Reed (1984:20-21) and Horn et al. (1987), Buckles' phase sequence is tied to only two chronometric dates and is based primarily upon correlation of cultural strata and comparisons with other dated sequences in adjacent regions. Buckles (1985) has recently augmented this phase sequence with five more radiocarbon age determinations and three dendrodates. This updated current cultural chronology of the Uncompahgre Plateau is presented in Figure 7. As can be seen, there are large gaps in the sequence, particularly the Dry Creek through Camel Back Phases, and all but one of the five new radiocarbon age estimates are inconsistent with Buckles' original scheme.

Recent excavations at the Indian Creek Site near Whitewater recovered charcoal samples which yielded 16 radiocarbon age estimates ranging between 4990±110 B.P. (median age 3790 B.C.)

Uncompahgre Plateau Cultural Historical Sequence (Years B.P.)[a]	Radiocarbon Age Determinations[b]			Dendrodates[b]	
	Christmas Rock Shelter (5DT2)	Shavano Spring Site (5MN40)	Sanburg Site (5MN43)	Lee Ranch Wikiup Village (5MN41)	5MN42
Escalante (70-450)				209[c] (Wikiup 1)	187[d] (Wikiup 1) 188[e] (Wikiup 2)
Camel Back (450-650)					
Coal Creek (650-1250)					
Ironstone-Dry Creek (1250-2450)					
Horsefly (1950-2450)		2100 ± 200[f] (Level 4)			
Roubideau (2450-4950)	1280 ±70[h] (Level 6) 6600 ± 100[i] (Level 8) 7140 ± 110[j] (Level 8)	2695 ± 180[g] (Level 5)			
Shavano (2950-5450)					
Monitor Mesa (3450-5450)			2280 ± 80[k] (Level 5)		
Buttermilk (4950-9950)	6650 ± 200[l] (Level 9B)				

[a] Buckles (1971)

[b] Buckles (1985)

[c] A.D. 1741: TRL UTE #2

[d] A.D. 1763: TRL UTE #4

[e] A.D. 1762: TRL UTE #5

[f] Isotopes 820

[g] Isotopes 821

[h] Beta - 12980

[i] Beta - 13055

[j] Beta - 13888

[k] Beta - 13054

[l] Beta - 13056

Figure 7. Chronometric dates obtained from sites on the Uncompahgre Plateau.

and 1460±840 B.P. (median age A.D. 467) (Horn et al. 1987:Table 5.2). The great majority of these dates, however, fall within the Archaic Stage (Figure 8).

We intend to refine the established cultural chronology of the Uncompahgre Plateau. To do so, we propose to collect chronometrically datable materials from different cultural levels or in association with obvious cultural features. If morphologically distinctive artifacts (e.g. projectile points) can be located within each of the dated cultural levels, or associated with a dated feature, then a temporal sequence of local artifactual styles can be formulated. Accomplishment of the latter will permit the assignment of a relative age to those sites or components which lack chronometric materials but contain one or more of the temporally diagnostic artifacts.

<u>Problem Domain 2: Paleoenvironmental Reconstruction</u>

It is often stated that the aboriginal groups who inhabited the region -- particularly those of the Archaic Stage -- had developed a lifestyle that was well-adapted to the regional environment. An understanding of the environmental parameters within which these groups subsisted is required before their lifestyles can be interpreted. Some researchers (e.g. Reed and Nickens 1980) have concluded from their studies that the regional environment has been relatively stable for the last 4-5,000 years or so (cf. Scott 1985). However, these paleoenvironmental models have been developed from data collected at sites that are located at least 55 km (35 mi) north. While the validity of these regional models is not disputed, we believe that an empirical

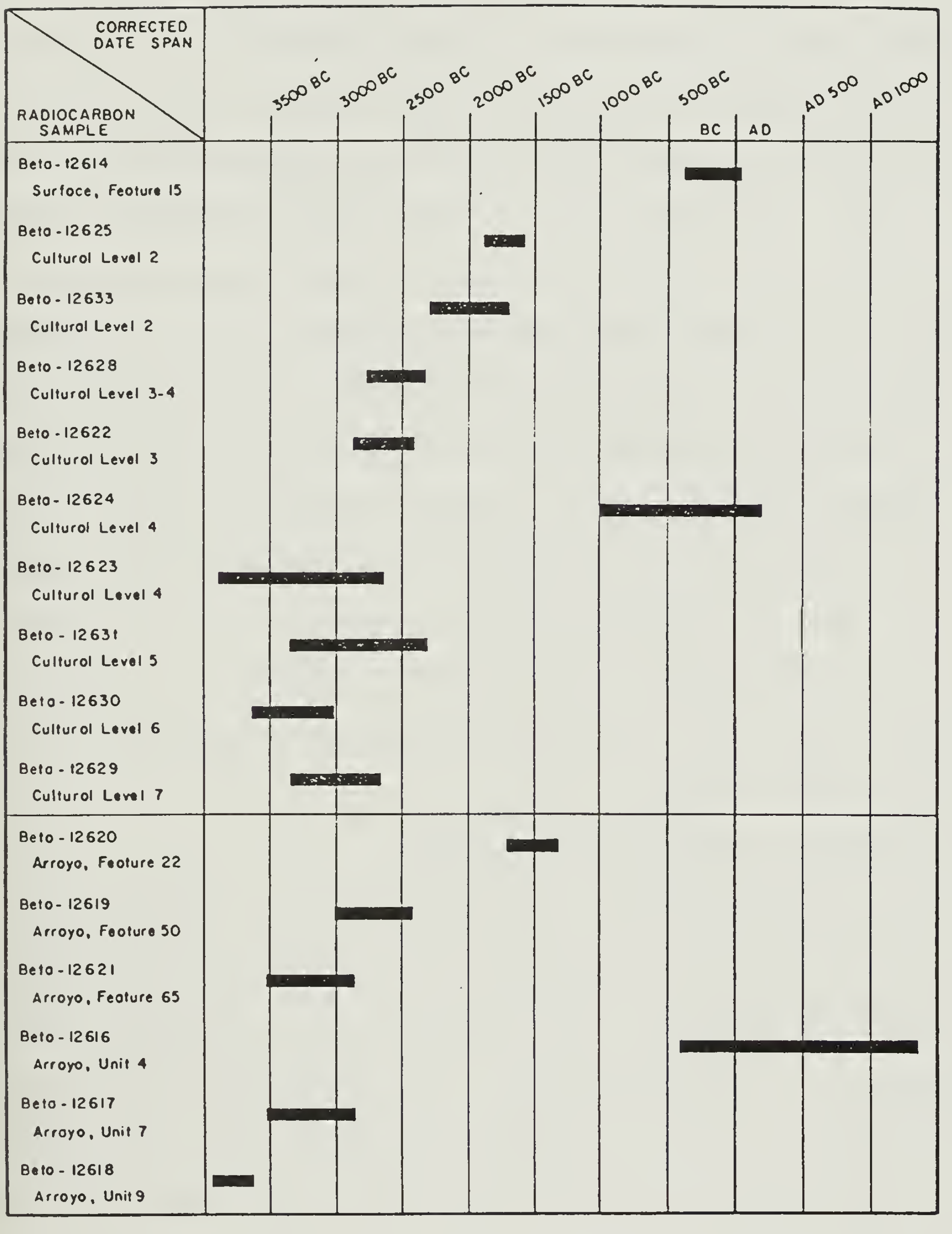


Figure 8. Calibrated range of radiocarbon dates obtained at the Indian Creek Site (5ME1373) (from Horn et al. 1987:133).

demonstration of paleoenvironmental stability (or variability) in the local area is required before analyzing the adaptive patterns of the aboriginal inhabitants. It is reasonable to suppose that microclimatic perturbations may have significantly affected the lifeways of these peoples even though the regional paleoenvironment may have fluctuated very little over a lengthy period of time.

Data will be collected from the Harris Site such that the local paleoenvironment can be reconstructed. These data include those that are most sensitive to climatic change, such as pollen, faunal remains, and sediments. Several lines of evidence will be collected so that their convergence will strengthen the resultant paleoenvironmental interpretations. Efforts will be made to collect these ecofactual data from contexts that have been chronometrically dated, thereby providing a chronology for the paleoenvironmental model.

Problem Domain 3: Prehistoric Lifeways

Once a local cultural chronology has been established and the paleoenvironment reconstructed, prehistoric patterns of settlement, subsistence, and extracultural relations can be interpreted. In simplest terms, our intentions are to define when prehistoric peoples occupied the Harris Site, how long they stayed, what they ate, and what other cultural groups they might have come in contact with during the course of their annual subsistence round.

This initial phase of research at the Harris Site will probably provide only partial answers to these questions since its focus will be diachronic rather than synchronic; that is, it will examine a sequence of occupational events, documenting the changes (if any) in the prehistoric lifeways from one point in time to another, rather than intensively investigate a single event. We anticipate that the synchronic perspective will be addressed in subsequent years.

This research emphasis notwithstanding, data will be collected that are germane to an understanding of the prehistoric lifeways represented at the Harris Site. Such data include microfloral (pollen) and macrofloral materials, faunal remains, and artifacts of non-local origins (e.g. ceramics, exotic lithic materials, turquoise, shell, etc.).

V

FIELD METHODS

As described in the preceding section, the principal objectives of the archaeological investigations at the Harris Site were to mitigate past vandalism and to gather scientific evidence pertaining to the site's natural and cultural history. The data needed to satisfy these objectives were collected by surface investigations and test excavations. The specific methods used for each endeavor are described below. The laboratory procedures and specialized studies used to analyze the collected data are also described.

Surface Analyses

The Harris Site does not consist simply of the stratified deposits in the rockshelter. Chipped stone and groundstone artifacts are lightly scattered on the slope below the shelter and across the alluvial bench on the south side of the drainage, and petroglyphs are incised on the rock walls behind, and downstream from, the shelter. The first objective of the field investigations was to construct a topographic map of the site and its immediate surroundings. Following that, the locations of each of the visible surface artifacts could be plotted on the map, and then collected. The spatial and morphological characteristics of these artifacts can be compared with those which are recovered from the test excavations. Finally, the locations and contents of the rock art panels were described.

Mapping

The site topography and distribution of artifacts were mapped using simple surveying instruments. A primary site datum, from which all mapping shots were taken, was established on a level area on the south side of the drainage, opposite of and slightly downstream from the rockshelter. A short section of plastic pipe was driven into the ground, capped, and inscribed with a large "X" and the site number ("5MN2341"). Its precise geographic location was determined by shooting back to a BLM cadastral marker with a known elevation on a hilltop immediately north of the site.

A survey transit was set up over this primary datum (P.D.) and levelled, and a series of instrument readings were systematically taken. One fieldworker sighted through the instrument at a stadia rod held by a second worker at an artifact or topographic location, determined the stadia readings, and called them out to a third worker who recorded the data. Using a calculator and simple trigonometric formulae, the distance, elevation, and azimuth to the point from the P.D. could be quickly calculated and recorded. Numerous topographic shots were taken so that the physical features of the site area could be accurately portrayed.

Surface Collection

All visible surface artifacts at the site were collected. This was deemed to be prudent in view of the vandalism which had occurred to the site and might continue to occur. Several workers walked carefully and thoroughly over the entire site area, closely examining the ground surface for artifacts or other evidence of human occupation. All finds were marked with pin flags. The mapping crew determined the spatial location of each find and assigned a consecutive Field Specimen (F.S.) number. The artifact was collected and placed in a properly labelled container, usually a sack or coin envelope. Artifacts in a concentration -- usually 10 or more items within an area 1-2 meters in diameter -- were collectively plotted, assigned one F.S. number, and placed together in a container.

Description of Rock Art Panels

Rock art is found on the back wall of the shelter, and on rock faces to the east of the shelter. There are six individual panels, each with their own arrangement of elements, but sharing similar configurations of abstract, incised lines; some also have zoomorphic and historic elements. The exact locations of these panels were determined by the mapping crew. The contents of each panel had been recorded in detail in 1984 by Chipeta Chapter members as part of the initial site recordation activities. During the recent site investigations, the panels were examined by Ms. Sally Cole, a rock art specialist; the results of her analyses are described in Appendix A.

Test Excavations

It was originally proposed (Chipeta Chapter 1987) to excavate a test trench in front (south) of the rockshelter, extending downslope to the edge of the drainage. Time constraints precluded this approach. Instead we chose to open up two contiguous one meter square test units near the vandal's pit, and a partial test unit in the cutbank of the stream. The data gathered from these units will permit us to derive some conclusions about the site's occupational and depositional history. The layout, excavation techniques, and recording procedures of the test excavations are described below.

<u>Layout of Test Units</u>

A grid system was set up to maintain horizontal control during the test excavations and for future investigations. A metal stake was placed at the east end of the vandal's pit, close to the cliff face which forms the back wall of the shelter. This Grid Datum (G.D.) was referenced to the P.D. and assigned the coordinates 100N, 100E. A Baseline was laid out from the G.D. to the stream edge, approximately perpendicular to the cliff face. Metal pins were placed in the ground at one meter increments along the Baseline, each one marking the northwest corner, or Unit Datum, of an individual test unit. Each Unit Datum was assigned letter/number designations indicating its spatial location relative to the G.D.; for example, 90N, 100E is 10 meters south of the G.D. along the Baseline. The elevation of each Unit Datum relative to the P.D. was determined with mapping instruments.

Two test units were laid out on either side of the Baseline at the top of the slope near the vandal's pit: 95N, 99E to the west of the Baseline, and 95N, 100E to the east. The other two corners of each unit were marked with a metal pin and a line strung around the four pins. A third test unit -- 92N, 106E-- was set up east of the Baseline at the edge of the drainage channel. The stream cutbank diagonally bisects this unit, leaving intact only the northwest corner. Excavations in this unit will expose a continuous profile of the site stratigraphy and illuminate the relationships of the natural and cultural deposits.

Excavation Techniques

Each one meter square test unit was excavated in artificial 10 cm increments, and each level was completely removed, screened, and recorded before continuing to the next level. Two workers usually worked in each unit: one to excavate, and the other to screen the excavated dirt, collect and bag artifacts, and record the results; the two changed positions after each level. The excavator carefully removed the dirt in each level, attentive to variations in soil color or compactness which might represent evidence of past human activity. All prepared tools found in situ were left there until excavation of the level was completed.

All excavated dirt was placed in plastic buckets and passed through a one-quarter inch mesh screen set up near the excavation units. After the screen was shaken thoroughly, the residue was carefully examined for artifactual or ecofactual (e.g. bone) materials. These materials were removed and placed in appropriately labelled containers.

Field Recording Procedures

Accurate records of the unit excavations were diligently maintained. As each level was completed, its contents and characteristics were described, noting such details as soil type and color, number and kinds of artifacts recovered, and any other pertinent details. A plan view of the unit at the bottom of each level was drawn, depicting the horizontal relationships of cultural remains and natural phenomena.

All artifactual and ecofactual materials, whether recovered in situ or in the screen, were recorded in a field catalog. Each item was assigned a Field Specimen (F.S.) number, and its horizontal provenience, level, vertical provenience, and type were described on the catalog form.

When a cultural feature (e.g. hearth) was found in a unit, it was completely exposed and described. It was sketched and photographed in plan view, bisected, sketched and photographed in profile, and samples of its interior contents collected for chronometric and subsistence information.

After excavations in each unit were completed, at least one vertical wall was carefully scraped to highlight stratigraphic details and then described, sketched, and photographed. From the north wall of Test Unit 92N, 106E, a suite of eight pollen samples were collected at regular intervals from discrete strata. Approximately one liter of dirt was collected from each sample location and placed in two labelled Ziploc bags. Each sample was assigned a separate F.S. number and its provenience was recorded on the F.S. list in the field catalogue.

Chronometric samples were collected from charcoal-rich strata in the stratigraphic profile of Test Unit 92N, 106E, and from the south wall of Test Unit 95N, 99E. If possible, at least one gram of charcoal was collected. Each sample was placed in aluminum foil, sealed, and put into a labelled Ziploc bag. It was assigned a F.S. number, and its provenience recorded in the field catalogue.

Specialized Studies

Several kinds of specialized information were collected from the Harris Site and its surroundings. Site formation processes, chronology, and site function can be interpreted from these data by specialists.

Ms. Nancy Lamm collected sediment samples from the west wall of Test Unit 92N, 106E, and from a thick sequence of alluvial valley fill approximately 75 meters downstream from the site. Ms. Lamm used the data gathered from these samples to interpret local paleoenvironmental conditions and site formation processes. Her methods and results are described in Appendix B.

Both vegetal specimens (i.e. large botanical remains such as wood) and small-scale botanical remains (e.g. seeds and fruits) were collected during the excavations either as individual specimens, or as bulk soil flotation samples from features. These macrobotanical remains were identified and interpreted by Ms. Meredith Matthews. Such remains can be used to identify the botanical resources available to and used by the prehistoric inhabitants of the Harris Site. The methods and results of the microbotanical analyses are described in Appendix C.

As mentioned above, eight pollen samples were collected in a column from the north wall profile of Test Unit 92N, 106E; a ninth sample was collected from the present ground surface as a control sample. Pollen was extracted from these samples, analyzed, and interpreted by Ms. Linda Scott; her methods and results are described in Appendix D. The results of the pollen analyses are used to reconstruct paleoecological conditions and to determine what plants may have been available to, and possibly used by, the prehistoric inhabitants of the site.

Numerous pieces of animal bone were recovered from the excavations, usually in the screen. These specimens were identified, where possible, to element and taxon by Mr. Ronald Rood; his methods of analysis and interpretations are described in Appendix E.

Several charcoal samples were collected from cultural features and stratigraphic profiles as described above. These samples were analyzed by Beta Analytic, Inc. for determination of their radiocarbon age.

Laboratory Procedures

All materials collected from the site surface or the test excavations were transported to a laboratory in Montrose. There, the Field Specimens were carefully checked, cleaned, and catalogued. A catalogue label was filled out for each specimen and placed in its container. Catalogue numbers were put on individual artifacts, such as prepared tools and groundstone, using Liquid Paper, India ink, and nail polish. The specialized study specimens were assembled and forwarded to the appropriate analyst.

All of the chipped stone tools and a small percentage of the debitage were analyzed by Dr. Tucker. The tools were described in detail and measured along several dimensions. Only rudimentary measurements and descriptions were made of the debitage. The remaining debitage and the groundstone were measured and described by Chipeta Chapter members.

All artifacts and ecofactual materials, accompanied by documentation (field forms, field notes, analysis records, catalogues, etc.) will be organized, packaged, and submitted to the Anasazi Heritage Center in Dolores, Colorado.

All artifacts were first segregated into two groups: artifacts which were made and used by prehistoric peoples, and historic artifacts of Euroamerican design or manufacture. The latter were examined and described by Mr. Jonathon Horn (Appendix C). The prehistoric items were analyzed by myself and Chipeta Chapter members: I examined all of the chipped stone tools and some of the debitage, while chapter members described the groundstone and the rest of the debitage. The prehistoric artifacts were sorted into a hierarchy of classes according to certain morphological characteristics. This hierarchy is illustrated in Table 1, and each artifact class is defined below.

Chipped stone artifacts are those items made of fine-grained, isotropic, siliceous materials (e.g. obsidian, chert, and quartzite), which can be fractured in a predetermined manner to produce a usable implement (Crabtree 1972:5). The end product of this manufacturing process is a prepared tool, an item used repeatedly for a prescribed task. Bifacial tools are modified on both sides, while unifacial tools are worked on only one face. Bifacial tools are further divided into subcategories which are presumed to represent distinctive stages along a lithic manufacturing continuum. Thomas and Bierwirth (1983) provide descriptively useful terms for these stages and describe how each stage can be distinguished from another. I follow their approach for further categorizing the Harris Site chipped stone artifacts.

Table 1 Hierarchical Scheme Used to Classify Artifacts Collected from the Harris Site

I. PREHISTORIC ARTIFACTS

A. Chipped Stone
1. Prepared tools
a. bifacial
(1) roughout
(2) blank
(a) rough percussion blank
(b) fine percussion blank
(3) preform
(4) finished product
(a) projectile point
(b) knife
b. unifacial
(1) scraper
(2) scraper plane
2. By-products of tool manufacture
a. core
b. debitage
(1) flake
(2) debris
3. Expedient tools
a. hammerstone
b. chopper
c. utilized flake

B. Groundstone
1. Metate
2. Mano

II. HISTORIC ARTIFACTS

The lithic reduction sequence involves the progressive thinning of a piece of stone, starting with a roughout, continuing through a blank and preform, and ending with a finished product. Absolute size and thinness indicate where in the sequence the bifacial tool belongs. These criteria are measured by such attributes as length, width, thickness, and weight for the former, and the thickness/width ratio for the latter. A <u>roughout</u> is usually much larger, heavier, and thicker than the latter stages, and lacks a definite form. The <u>blank</u> is generally smaller (thinner and lighter) and more symmetrical than a roughout and exhibits more refined percussion flaking, more regular and less sinuous lateral margins, and a more defined outline. <u>Fine percussion blanks</u> have more of a definite shape than <u>rough percussion blanks</u>, but the nature of the final product is still unclear for both. The <u>preform</u> has been partially shaped by pressure flaking, but its final form is still unclear. The <u>final product</u> is characterized by straight edges shaped by pressure retouch and a symmetrical outline; its function can often, though not always, be inferred from their form. The Harris Site artifact assemblage includes two types of finished product: projectile point and knife. A <u>projectile point</u> is a hafted biface with at least one pointed end and a stemmed, notched, fluted, or thinned base. Larger hafted bifaces were probably attached to a spear or atlatl shaft; smaller points were probably attached to an arrow shaft. A <u>knife</u> is a symmetrical, generally leaf-shaped biface with straight, pressure-flaked edges. I acknowledge that some of the "projectile points" in the assemblage could actually have been used as knives. Microscopic analyses of the working edges of these artifacts could have helped to identify their function, but such analyses were not performed [see Rowan and Thomas (1983), and the references contained therein, for more discussion on this subject].

Two types of unifacial tools were found at the Harris Site: scraper and scraper plane. A <u>scraper</u> is a small- to medium-sized flake whose margins have been deliberately retouched on one face (Thomas and Bierwirth 1983:224). A <u>scraper plane</u> is large, often plano-convex in profile, from whose margins large flakes have been removed and whose edges are often battered and step fractured (Thomas and Bierwirth 1983:226).

During the tool manufacturing process, several by-products are produced which provide important clues about this process. A <u>core</u> is the parent mass, or nucleus, from which flakes are detached to make usable tools. Its surface bears a negative image, or scar, of the flake which was removed. Secondary use of the core as a chopper or hammerstone is indicated by battering. <u>Debitage</u> is residual lithic material resulting from tool manufacture (Crabtree 1972:58); it includes flakes and debris. A <u>flake</u> is a piece of stone removed from the core through the direct or indirect application of force (Crabtree 1972:64). <u>Debris</u> are angular pieces of disintegrated rock produced during lithic manufacture, but having very little diagnostic value (Crabtree 1972:58).

<u>Expedient tools</u> are lithic artifacts which exhibit little or no deliberate modification, but show clear signs of having been

used for a specific task. A hammerstone is an unshaped stone whose edges have been battered. A chopper is a large stone with a deliberately shaped cutting edge that is often step fractured or battered. A utilized flake is simply a flake which shows evidence of bifacial or unifacial use.

Groundstone is a general category which subsumes all artifacts that were used to grind something, usually foodstuffs. Groundstone found at the Harris Site are metates and manos. A metate is a large slab of stone, usually sandstone or quartzite, on which the items were ground. Its edges sometimes are shaped through percussion flaking. A mano is the stone held in the hand while grinding. It is often a flat, oval river cobble whose edges are shaped by rough percussion or pecking. One or both faces may have been used, as indicated by smoothing and striations.

All of the above tools, except the debitage, were described in detail, weighed, and measured along several dimensions. Only the material and general size (small, medium, and large) of the debitage were described.

Disposition of Recovered Materials

All artifacts and ecofactual materials will be organized, packaged, and submitted to the Anasazi Heritage Center (AHC) in Dolores, Colorado for curation. Organization and packing will be according to AHC procedures. Documentation such as field forms, field notes, analysis records, and catalogs will accompany these materials.

VI

RESULTS

The archaeological investigations conducted at the Harris Site over the last three years have collected an impressive amount of information, the analysis and description of which will allow us to formulate an initial interpretation of the site's natural and cultural history. This section describes in detail the collected data, segregated generally into surface manifestations, rock art, and buried materials. These results are interpreted within the framework of the known culture history in Chapter 7.

Surface Manifestations

Site Layout

The Harris Site is distinguished by a shallow rockshelter, six panels of rock art on the cliff face behind the rockshelter, two possible features, and a light scatter of prehistoric and historic artifacts, located on both sides of a shallow, northeast to east trending intermittent drainage (Figure 9). Vandals have dug a large pit under the rockshelter and exposed the natural and cultural strata of the site. The vandals discarded unwanted artifacts -- fragments of groundstone and chipped stone -- around the edge of the pit.

The north side of the drainage is narrow and slopes moderately from the cliff face to the drainage. Where it trends to the northeast, the drainage has eroded a shallow cutbank in the slope, revealing a thick sequence of cultural deposits, or

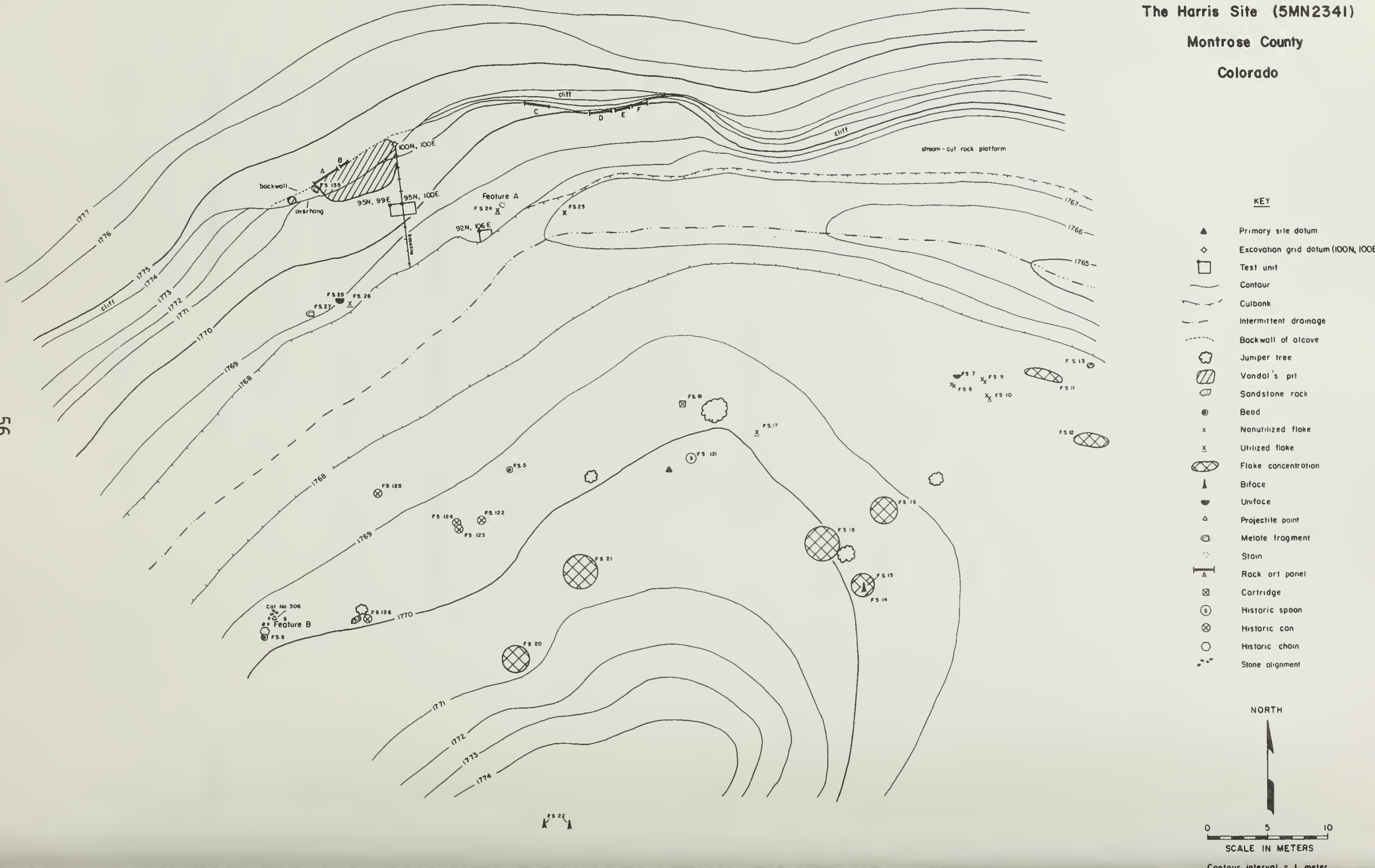
Figure 9

Topographic Map of

The Harris Site (5MN2341)

Montrose County

Colorado



midden, extending out and downslope from the rockshelter. Just east of the shelter, the drainage bends sharply to the east to intersect with the cliff face: it has stripped off all alluvial deposits in this area and cut a level platform in the underlying Dakota sandstone. Downslope and slightly east of the rockshelter is a small (less than 1 meter in diameter), circular, charcoal-stained area; it is designated Feature A. The south side of the drainage is wider, with a gentle slope, areas of level ground, and relatively thick alluvial deposits. At the western edge of the site on this side, there is an arrangement of sandstone rocks which may be a cultural feature; it is labelled Feature B.

Except for the vandal's discards, very few artifacts are found on the north side of the drainage, and these few are close to the cutbank. The surface artifact assemblage from the north side consists of one uniface, one biface, one utilized flake, and one metate fragment.

In contrast, the south side has an abundance of artifacts scattered across its surface. There are eight concentrations of flakes on the southern edge and east side of the site area; seven more flakes, including one which was utilized, are scattered lightly through the latter area. Three bifaces and a utilized flake were also found in this general area. The most interesting items found in this locale, however, were artifacts of proto-historic or historic manufacture. These include five metal cans, a metal spoon, a rifle cartridge, a short length of chain, and 12 seed beads.

Description of Artifacts

A total of 365 artifacts was collected from the surface of the site. This total includes those artifacts which were excavated and discarded by the vandals around their diggings, but not those found on the surface of a test unit. The majority (345 or 95 percent) of these artifacts are prehistoric; the remainder are historic.

Prehistoric Artifacts

Table 2 summarizes the kinds and numbers of prehistoric artifacts collected from the surface. As can be seen, most of these artifacts are chipped stone, and the majority of them are flakes. However, only about 25 percent of these artifacts actually came from the site surface (see Figure 9): most were found in the vandal's discard piles and probably originated in a buried context. Also, all but two of the metates (F.S. 27 and F.S. 135) came from the vandal's piles. Each of the major subcategories of artifacts -- prepared tools, by-products of tool manufacture, expedient tools, and the groundstone -- are described in greater detail below.

Chipped Stone

Prepared Tools

About two-thirds of the prepared tools are bifacially worked; the remainder are unifacially worked.

Bifacial Tools. Detailed measurements and descriptions of the bifacial tools, excluding the projectile points, are given in Table 3; selected examples are illustrated in Figures 10-13. The majority of the bifacial tools represent the earlier

Table 2 Summary of Prehistoric Artifacts Collected from the Surface of the Harris Site

Artifact Class	Artifact Totals		Subtotals N (%)[a]	TOTALS N (%)[b]
CHIPPED STONE				315 (91)
Prepared Tools			24 (8)	
Bifacial tools	/16/			
roughout	5			
blank	4			
rough percussion blank		3		
fine percussion blank		1		
preform	2			
finished product	5			
projectile point		4		
knife		1		
Unifacial tools	/8/			
scraper	6			
scraper plane	2			
By-products of Tool Manufacture			278 (88)	
Core	/8/			
Debitage	/270/			
flake	242			
debris	28			
Expedient Tools			13 (4)	
Hammerstone	/0/			
Chopper	/1/			
Utilized flake	/12/			
GROUNDSTONE				30 (9)
Metate	/17/[c]			
Mano	/13/[c]			
			GRAND TOTAL	345 (100)

[a] percentage of Total N
[b] percentage of Grand Total
[c] fragments

Table 3 Morphological Characteristics of Bifacial Tools from the Site Surface[a]

Catalog No.	F.S. No.	Linear Measurements (mm)[b] Length (L)	Width (W)	Thickness (Th)	Th/W Ratio	Weight[b] (gm)	Material	Mfg. Stage[c]	Illustration
1	1	70.9	41.4	7.4	0.179	unknown	quartzite	knife	---
14	11	(48.0)	(25.7)	5.3	(0.206)	(5.0)	chert	preform	---
18	15	(56.2)	35.9	10.2	0.284	(24.7)	quartzite	R.P. blank	---
25	22	63.5	42.6	16.6	0.390	44.0	quartzite	R.P. blank	Fig. 10
26	22	(55.2)	(31.7)	6.1	(0.192)	(10.2)	quartzite	preform	---
40	36	(56.2)	33.4	6.0	(0.179)	(12.6)	quartzite	F.P. blank	Fig. 10
62	58	63.3	51.3	18.3	0.357	58.8	chert	roughout	Fig. 11
63	59	70.4	67.9	16.9	0.249	80.6	quartzite	roughout	Fig. 12
64	60	74.0	82.0	28.7	0.350	160.6	quartzite	roughout	---
66	62	67.9	76.5	25.0	0.327	135.6	quartzite	roughout	Fig. 13
70	63	(93.5)	(43.4)	10.5	(0.242)	(35.5)	quartzite	R.P. blank	---
111	100	51.7	30.2	14.5	0.480	21.9	chert	roughout	Fig. 10

[a]does not include projectile points

[b]estimates for incomplete dimensions are given in parentheses

[c]R.P., rough percussion; F.P., fine percussion

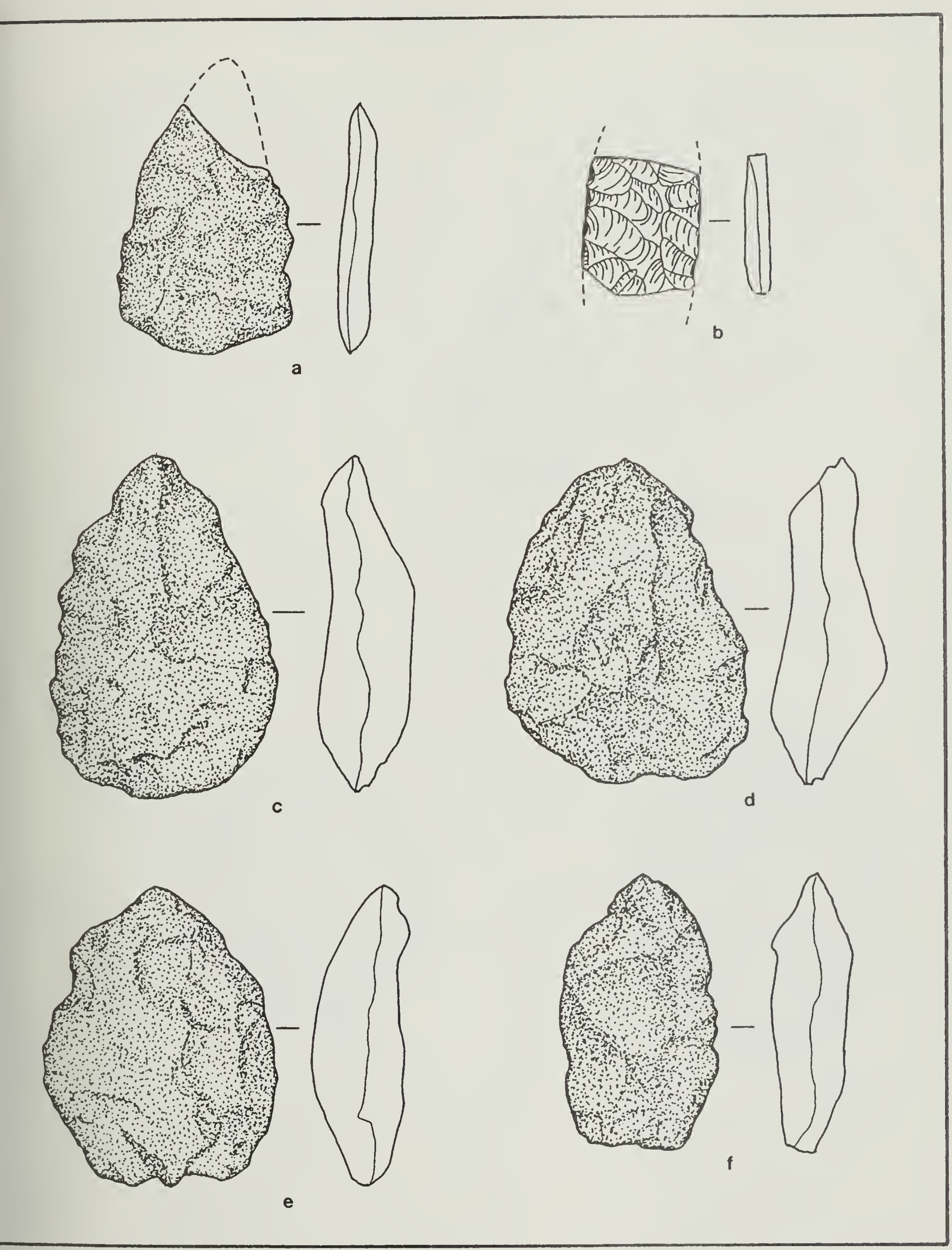


Figure 10. Bifacial tools: a, F.P. blank (Cat. No. 40); b, knife (Cat. No. 178); c, R.P. blank (Cat. No. 25); d, roughout (Cat. No. 182); e, roughout (Cat. No. 172); f, roughout (Cat. No. 111).

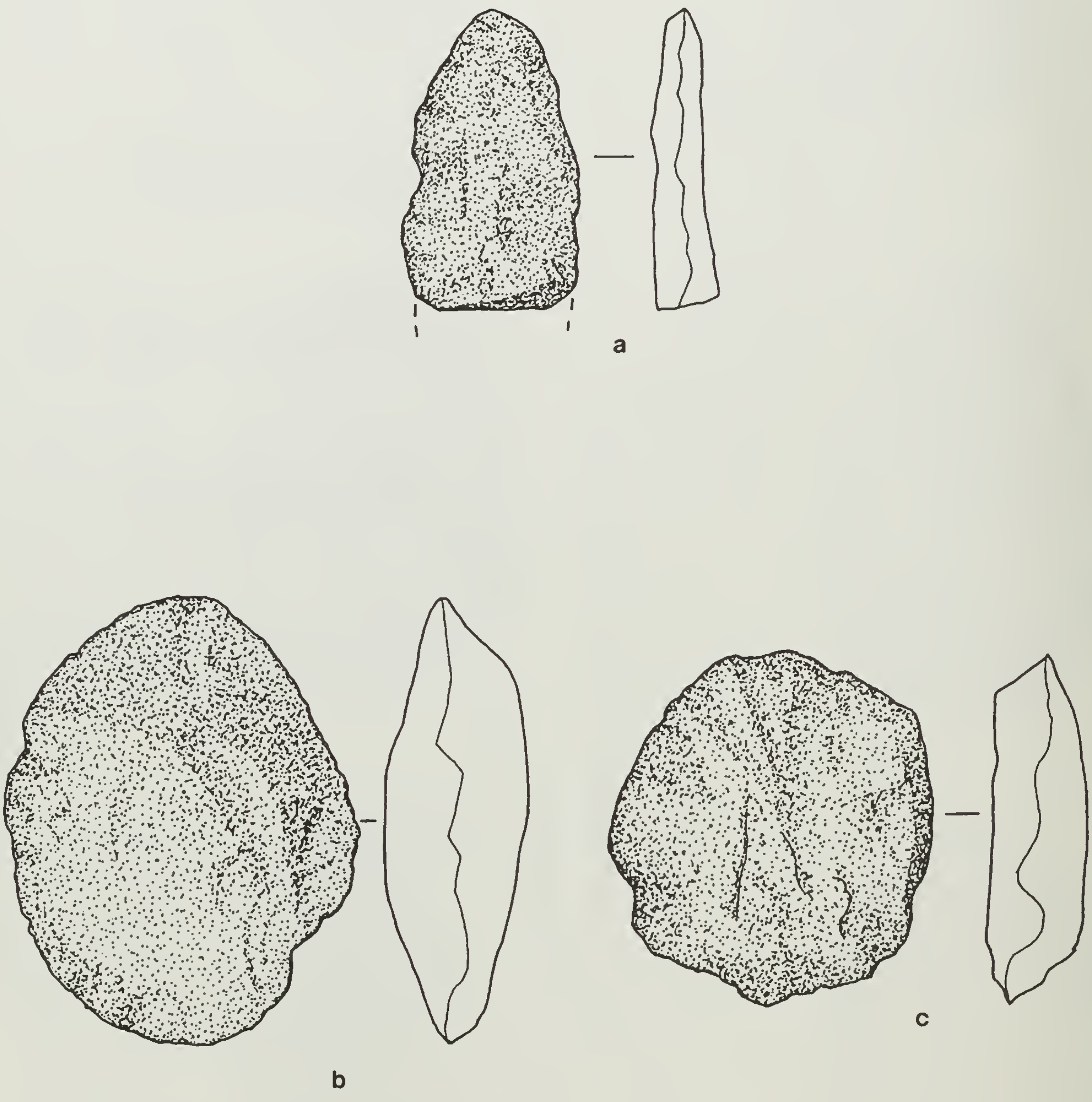


Figure 11. Bifacial tools: a, roughout (Cat. No. 173); b, roughout (Cat. No. 62); c, roughout (Cat. No. 174).

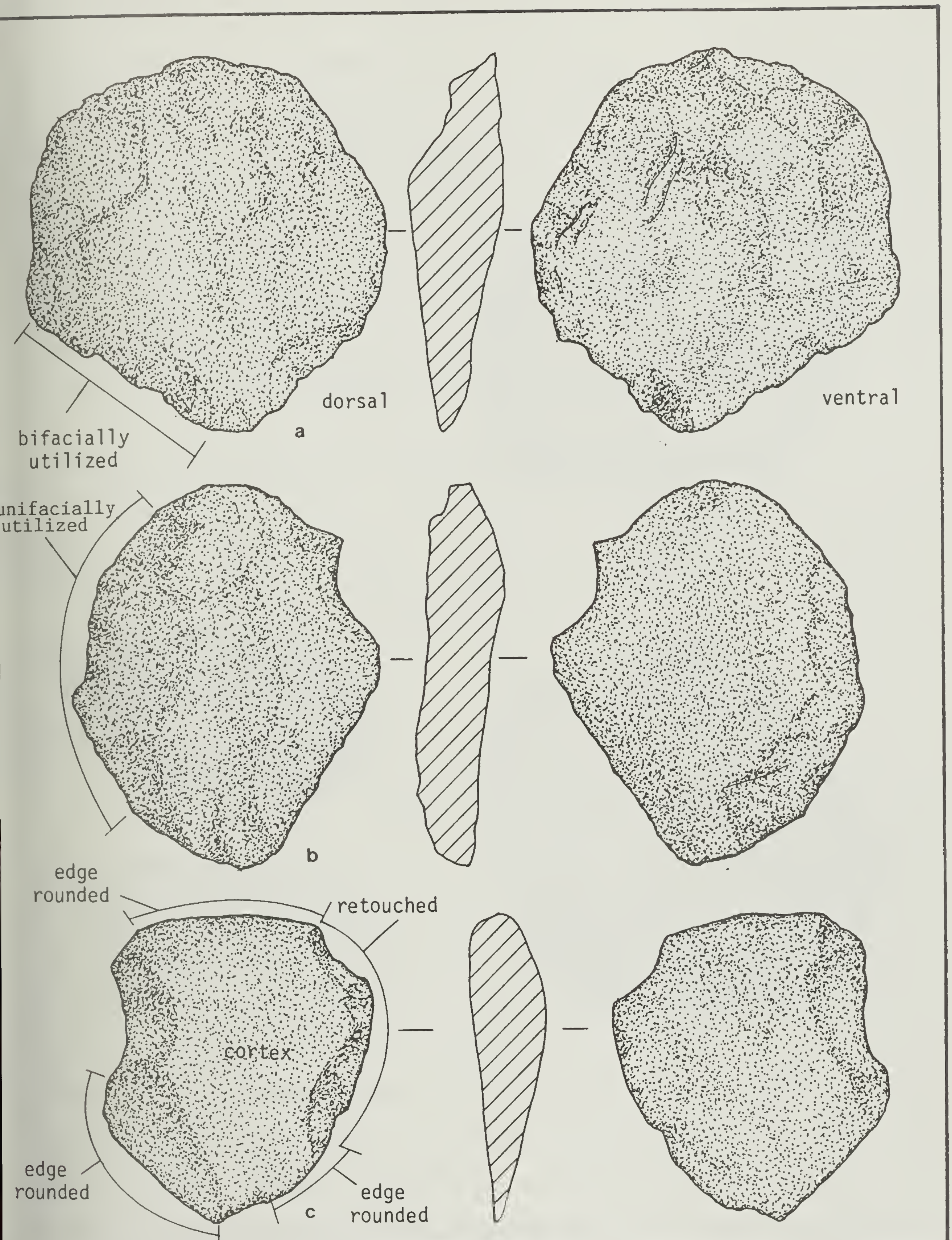


Figure 12. Various tools: a, roughout (Cat. No. 63); b, scraper (Cat. No. 46); c, utilized flake (Cat. No. 45).

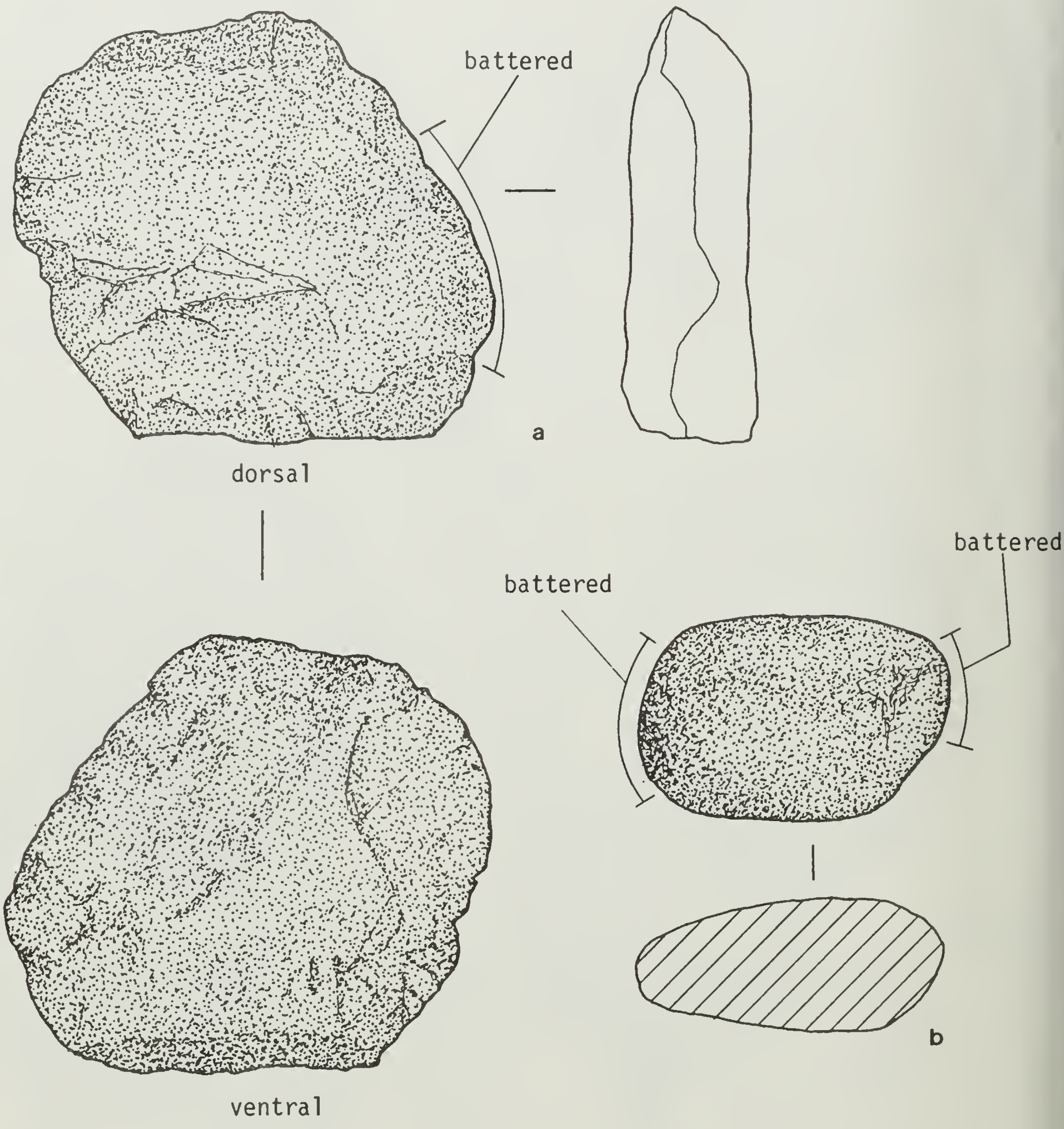


Figure 13. Two tools: a, roughout (Cat. No. 66); b, hammerstone (Cat. No. 175).

stages of biface manufacture, i.e. roughout, blank, or preform. The preferred raw material is quartzite, but the color of the individual artifact varies from tan, through reddish-brown and gray-brown, to gray. As befitting their preliminary stage of manufacture, three-fourths of the tools still retain cortex on their faces. There is a clear diminishment in size of the artifacts, particularly in weight and the thickness/width ratio (Table 4), corresponding to the stage of manufacture.

Table 4. Mean Dimensions of Bifacial Tool Categories from the Site Surface

Artifact Category	N	Mean Length (mm)	Mean Width (mm)	Mean Thickness (mm)	Mean Th/W Ratio	Mean Weight (gm)
roughout	5	65.5	61.6	20.7	0.353	91.5
R.P. blank	3	71.1	40.6	12.4	0.305	34.7
F.P. blank	1	56.2	33.4	6.0	0.179	12.6
preform	3	51.6	28.7	5.7	0.199	7.6
knife	1	70.9	41.4	7.5	0.179	---

Only four projectile points were found on the surface of the site (Table 5), and three of those (Cat. Nos. 2, 3, and 4) were recovered during the initial reconnaissance and recordation of the site in 1984. As was the case with the other bifacial tools, quartzite was the preferred lithic material for the projectile points. Catalog Nos. 2 and 3 (Fig. 14a and 14b) are portions of large corner-notched types with straight bases, which in the Intermountain West region are most consistently labelled Elko Corner-notched (Holmer 1986:101). In the eastern areas of the region (i.e. Utah and western Colorado), the style is extraordinarily persistent, appearing in dated contexts which span the

Table 5 Morphological Characteristics of Projectile Points from the Site Surface[a]

		Linear Measurements (mm)						Shoulder Angles (°)		Weight (gm)			
Cat. No.	F.S. No.	Max. Length	Axial Length	Max. Width	Basal Width	Neck Width	Thickness	DSA[b]	PSA[c]	Actual	Est.	Material	Illustration
2	2	(55.6)	(55.6)	34.1	24.5	17.1	4.7	151	136	unk.	unk.	qtzite.	Fig. 14a
3	3	(37.8)	(37.8)	30.6	19.4	12.9	5.6	141	120	unk.	unk.	chalc.	Fig. 14b
4	4	22.8	unk.	12.5	unk.	unk.	3.0	unk.	unk.	unk.	unk.	qtzite.	Fig. 14c
306	--	27.2	27.2	18.1	11.4	9.9	4.1	152	115	1.9	2.0	qtzite.	Fig. 14d

[a]unk., measurements not obtained; measurements in parentheses are estimates on broken specimens

[b]DSA, distal shoulder angle

[c]PSA, proximal shoulder angle

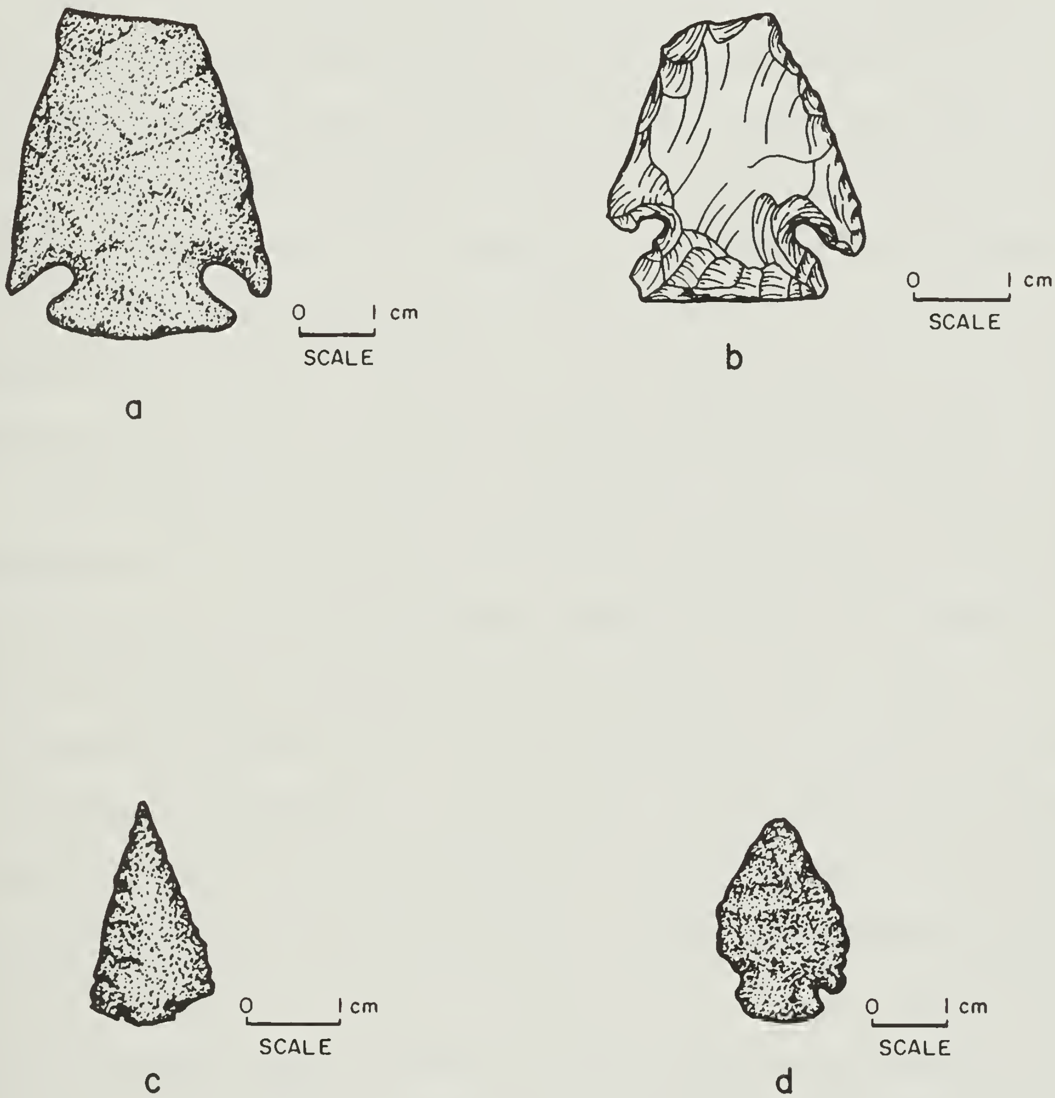


Figure 14. Projectile points recovered from the site surface: a, Cat. No. 2; b, Cat. No. 3; c, Cat. No. 4; d, Cat. No. 306.

entire Archaic stage, from about 6000 B.C. to A.D. 1000 (Holmer 1986:102). The reasons for these surges in popularity have yet to be determined. These two points also resemble the Type 26 variety found on the Uncompahgre Plateau, which Buckles (1971) places in the Ironstone Phase, dated to A.D. 0-700 and coinciding with the youngest florescence of the Elko Corner-notched type.

The other two points recovered from the surface of the site (Catalog Nos. 4 and 306) are small corner-notched varieties which were probably attached to arrow shafts; beyond this characteristic, the two artifacts are quite dissimilar. The blade margins on Catalog No. 4 are relatively straight and slightly serrated (Figure 14c). The extreme portion of the base is missing, but it is apparent that the notches were shallow and narrow, and set low on the base. This point closely resembles those of the Rosegate Series, which occur throughout the eastern portions of the Intermountain West from about A.D. 300 to A.D. 900-1000 (Holmer 1986:106). In contrast, Catalog No. 306 has more excurvate blade margins and slightly wider notches which are not set as low on the base (Figure 14d). It matches the Type 4 or Type 5 varieties of the Uncompahgre Plateau, which Buckles (1971) assigns to the Coal Creek Phase, dated to A.D. 700-1300.

Unifacial Tools. Unifacially worked tools are segregated into two general subcategories: scraper and scraper plane. Scraper planes are distinguished from scrapers by their larger size, plano-convex profile, percussion-flaked margins with large flake scars, and sometimes battered and step fractured edges. The morphological differences between the two categories suggest that the scraper planes were used for "heavy duty" tasks, e.g. to shred and soften tough vegetal materials. Scrapers, however, can be used on both a "soft" medium, such as flesh and hide, or a "hard" medium, such as bone or wood (Rowan and Thomas 1983:327).

Eight unifaces were recovered from the site surface, of which six are classified as scrapers and two as scraper planes. Their dimensions are summarized in Table 6; selected examples are illustrated in Figures 11 and 15. The preferred lithic material was quartzite, but three artifacts were fashioned out of cryptocrystalline silicates. In this sample, the scraper planes are slightly larger than the scrapers (Table 7), but narrower. The scrapers appear to weigh more, but the average value has been inflated by Catalog No. 65: if this specimen is removed from the compilation, all of the mean dimensions of the scrapers are noticeably reduced (Table 7). The two scraper planes are hardly more than retouched "chunks" of stone, and the margins on both are step fractured, suggesting heavy use. All of the scrapers show evidence of use by microscarring, rounding, or step fracturing.

Table 7 Mean Dimensions of Unifacial Tool Categories

Artifact Category	Mean Length	Mean Width	Mean Thickness	Mean Weight
scraper	51.5 (46.3)[a]	57.9 (51.5)[a]	19.4 (17.4)[a]	66.8 (37.2)[a]
scraper plane	64.6	35.1	20.2	44.6

[a]excluding Cat. No. 65

Table 6 Morphological Characteristics of Unifacial Tools from the Site Surface

Catalog No.	F.S. No.	Linear Measurements (mm) Length	Width	Thickness	Weight (gm)	Material	Type	Illustration
8	7	27.5	45.5	11.5	15.4	chert	scraper	Fig. 15c
29	25	66.1	38.3	14.3	35.9	quartzite	scraper plane	---
46	42	70.9	57.1	13.9	56.5	quartzite	scraper	Fig. 11c
65	61	77.2	90.2	29.6	214.4	quartzite	scraper	---
69	63	41.5	49.6	22.2	34.9	chert	scraper	Fig. 15a
71	63	51.0	49.2	17.4	42.5	quartzite	scraper	---
72	63	63.0	31.9	26.0	53.3	chalcedony	scraper plane	Fig. 15d
73	63	40.8	55.9	22.0	36.8	quartzite	scraper	---

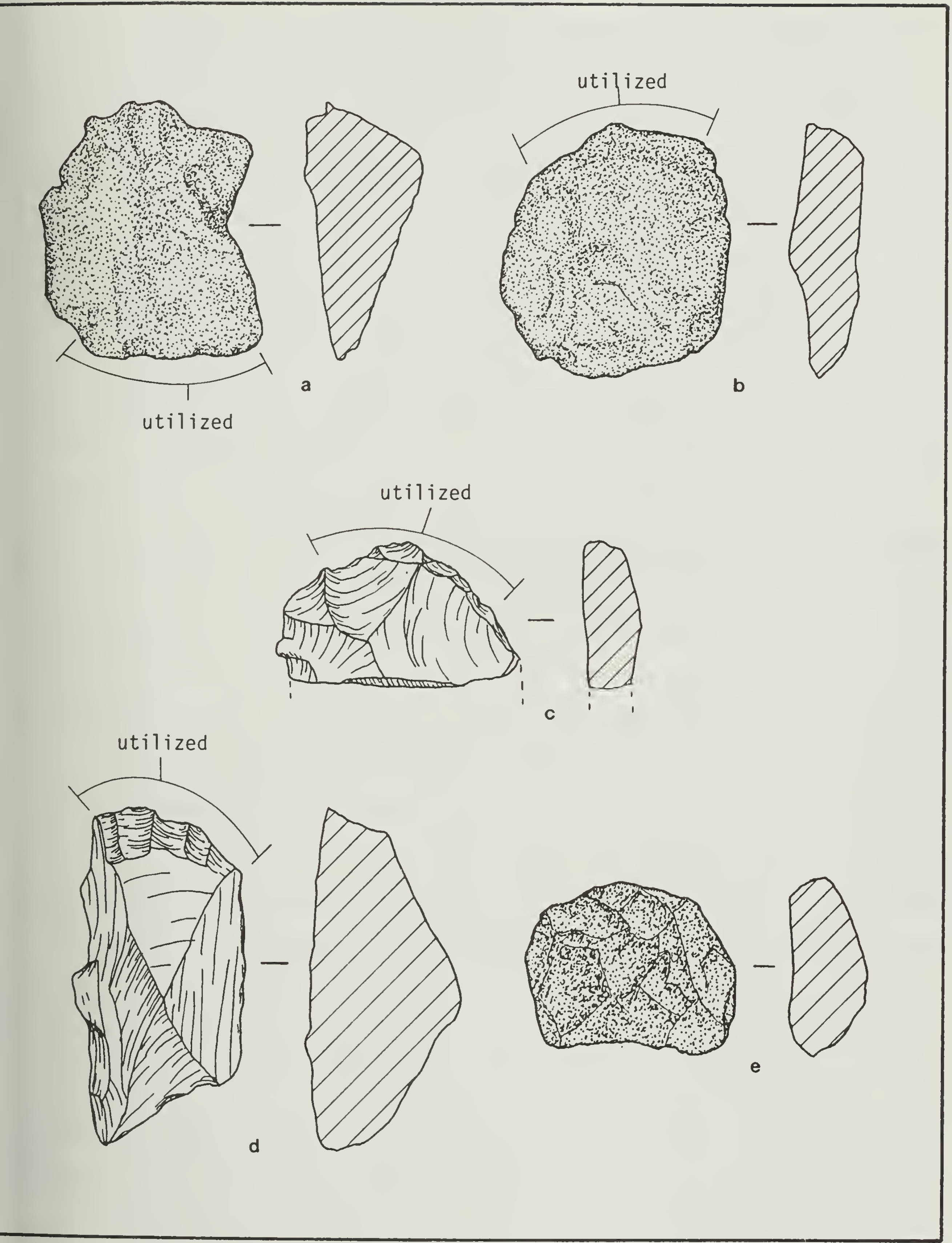


Figure 15. Several tools: a, scraper (Cat. No. 69); b, utilized flake (Cat. No. 30); c, scaper (Cat. No. 8); d, scraper plane (Cat. No. 72); e, scraper (Cat. No. 154).

By-Products of Manufacture

The overwhelming majority of the artifacts recovered from the surface of the site are classified as by-products of manufacture, i.e. cores and debitage. Of this group, debitage predominates, comprising 97 percent of the total. Eight cores were found in the vandal's discard piles. Their dimensions are summarized in Table 8; selected examples are illustrated in Figures 16 and 17. None of the cores are overly large; some (Cat. Nos. 67, 68, and 87), in fact, are quite small, suggesting that the aboriginal inhabitants were either reducing lithic materials to near exhaustion or using small pieces. The flakes removed from these cores are few and relatively large. In this sample, quartzite was the preferred raw material.

A total of 270 pieces of debitage was collected from the site surface or the vandal's discard piles: nearly two-thirds of the total came from the latter. Most (90 percent) of the debitage are flakes, the remainder being angular pieces of stone, or debris. Table 9 summarizes and compares the general material types and size categories of the debitage. It is readily apparent that most of the debitage is some form of cryptocrystalline silicate (CCS) (i.e. chert or chalcedony) and moderate in size.

Examining the data closer, however, there appears to be some relationship between the size of the artifact and the material type: the smaller pieces of debitage are more likely to be CCS, and the larger pieces to be quartzite. We can test the significance of this supposed relationship with the chi-square statistic. Starting with the null hypothesis (H_o) that material

Table 8 Morphological Characteristics of Cores from the Site Surface

Cat. No.	F.S. No.	Linear Measurements (mm) Length	Width	Thickness	Material	Illustration
67	63	54	47	26	chert	---
68	63	50	45	25	quartzite	---
79	68	90	85	40	quartzite	Fig. 17d
82	74	85	75	70	quartzite	Fig. 16c
84	72	110	90	65	quartzite	Fig. 17a
85	73	75	70	50	quartzite	Fig. 16b
86	75	130	100	100	quartzite	Fig. 16a
87	76	50	50	35	quartzite	Fig. 17c
	$\bar{x}$ =	80.5	70.2	51.4		
	S.D. =	29.3	21.1	25.7		

Table 9 Debitage Material Types and Sizes

Size Categories[a]	Material Types CCS[b]	Quartzite	Other[c]	TOTALS (%)
small (< 2.0 mm)	41	10	0	51 (19)
medium (2.0-4.0 mm)	92	49	2	143 (53)
large (> 4.0 mm)	22	51	3	76 (28)
TOTALS (%)	155 (57)	110 (41)	5	270 (2)

[a]numeric values shown are the diameters of circles within which the artifact fits

[b]cryptocrystalline silicates: includes chert and chalcedony

[c]includes unknown sedimentary and igneous rock types

type and size are not related, and excluding the Other material type (because of low expected frequencies), we compute a chi-square value of 37.76, which exceeds the expected value for 2

Figure 16. Selected cores from the Harris Site: a, Cat. No. 86; b, Cat. No. 85; c, Cat. No. 82; d, Cat. No. 140.

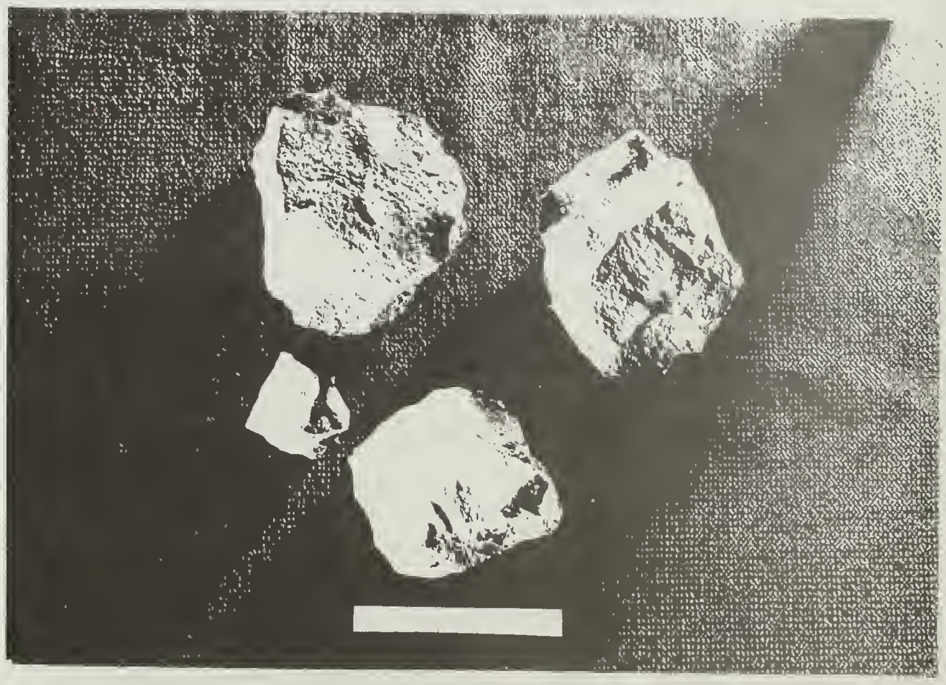


Figure 17. Selected cores from the Harris Site: a, Cat. No. 84; b, Cat. No. 155; c, Cat. No. 87; d, Cat. No. 79.

degrees of freedom of 13.82 at the .001 level of significance (Thomas 1976). Thus, we can reject H_o and accept the alternative hypothesis (H_1) that there is a relationship between size and material type: smaller flakes are more likely to be a CCS, while larger flakes will be quartzite.

It is not immediately apparent why this relationship exists, but we may hazard a guess that CCS materials were used for flake tools (that is, the detached flake was further reduced into a usable implement), while the slightly less homogeneous quartzite materials were best for core tools. Because much of the debitage came from a disturbed context (i.e. the vandal's discard piles), however, we may want to be cautious in accepting these results and interpretations. The excavated data should provide clearer answers.

Expedient Tools

A small number of artifacts exhibit signs of having been used for some task; they are considered to be tools of expediency. The artifacts placed in this category are those on which the evidence of use is obvious. Such evidence includes battering, step fracturing, or extensive microscarring. More subtle signs of use could only be detected with intensive use-wear analysis, a technique which was not attempted in this study.

Thirteen expedient tools were recovered from the site surface, including one chopper and 12 utilized flakes. Table 10 describes the dimensions and characteristics of these tools. Five of the utilized flakes are made from cryptocrystalline silicate materials (chert or chalcedony), and five are quartzite; the

Table 10 Morphological Characteristics of Expedient Tools from the Site Surface

Cat. No.	F.S. No.	Linear Measurements (mm) Length	Width	Thickness	Weight (gm.)	Material	Description of Use Wear: Location distal end	proximal end	one margin	two margins	Faciality one face	two faces	Type
12	10	34.0	20.6	4.6	3.9	chalcedony	X		X		X		utilized flake
20	17	35.3	32.7	8.8	9.8	chert			X			X	utilized flake
28	24	88.3	49.2	7.9	63.8	chert	X					X	utilized flake
30	26	48.1	43.0	8.3	32.7	chert				X	X		utilized flake
41	37	93.4	73.6	31.5	194.3	quartzite		X		X		X	chopper
43	39	69.6	47.0	14.0	40.5	quartzite			X			X	utilized flake
44	40	46.2	80.8	18.2	53.7	igneous	X		X		X		utilized flake
45	41	56.7	51.9	8.3	38.8	igneous	X	X	X	X		X	utilized flake
47	43	81.6	83.6	19.4	126.7	quartzite			X			X	utilized flake
80	69	54.2	82.0	16.5	81.3	quartzite	X					X	utilized flake
81	70	61.7	59.9	14.8	50.8	chert	X			X	X		utilized flake
83	71	65.5	74.5	15.8	75.0	quartzite				X	X		utilized flake
88	77	74.4	80.2	23.9	110.2	quartzite	X					X	utilized flake
	$\bar{X}$ =	62.2	59.9	14.8	67.8	TOTALS =	7	2	6	5	5	8	
	S.D. =	19.0	20.8	7.5	51.9								

chopper is made of quartzite; and two utilized flakes are made from some type of igneous material. The use wear on these artifacts is most likely to be on the distal end, and nearly equally divided between one or both margins; most have been used on both faces.

One of the utilized flakes (Cat. No. 45) is unique. It is a relatively small flake which has been smoothed and abraded on both ends, both margins, and both faces (Figure 12c). I believe that this flake was used to incise at least some of the grooved elements in the rock art panels on the cliff face. In her analysis of the rock art (Appendix A) Sally Cole confirms this interpretation. Wormington and Lister (1956:9) also found a quartzite flake at the Moore Site which had "one extraordinarily smooth edge". They verified experimentally that such a flake, when rubbed against the sandstone, would form grooves similar to those making up the petroglyphs at the site, and produce smoothed edges identical to those on the flake (Wormington and Lister 1956:9).

<u>Groundstone</u>

Thirty fragments of goundstone were recovered from the site surface: all but two (F.S. 27 and F.S. 135 - see Figure 9) came from the vandal's discard piles. Seventeen of these fragments have been identified as metates, and 13 are manos. Many of these pieces are so fragmentary that it is difficult to determine exactly how many whole artifacts they represent. Table 11 summarizes the dimensions and other attributes of the groundstone; selected examples are illustrated in Figures 18 and 19. All but

Table 11 Morphological Characteristics of Groundstone from the Site Surface[a]

Cat. No.	F.S. No.	Linear Measurements (mm)[a]			Material	Facial Use	Type	Illustration
		Length	Width	Thickness				
31	27	---	---	---	sandstone	unifacial	metate	---
32	28	420	190	65	sandstone	unifacial	metate	Fig. 18
33	29	280	145	25	sandstone	unifacial	metate	---
34	30	---	---	---	sandstone	unifacial	metate	---
35	31	200	160	55	sandstone	unifacial	metate	---
36	32	320	240	70	sandstone	unifacial	metate	---
37	33	275	150	85	sandstone	unifacial	metate	---
38	34	260	190	25	sandstone	unifacial	metate	---
42	38	135	90	55	sandstone	unifacial	mano	Fig. 19a
48	44	70	95	70	sandstone	unifacial	mano	Fig. 19b
49	45	95	(50)	35	igneous	unifacial	mano	---
50	46	(50 mm diameter)		---	sandstone	bifacial	mano	---
51	47	(35)	90	60	sandstone	bifacial	mano	---
52	48	---	---	65	sandstone	unifacial	mano	---
53	49	125	(55)	55	sandstone	bifacial	mano	---
54	50	(50 mm radius)		35	sandstone	unifacial	mano	Fig. 19c
55	51	---	---	---	sandstone	unifacial	mano	---
56	52	---	---	---	sandstone	unifacial	mano	---
57	53	---	---	40	sandstone	bifacial	mano	---
58	54	---	---	---	sandstone	unifacial	mano	---
59	55	(55 mm diameter)		43	sandstone	unifacial	mano	---
60	56	---	---	---	sandstone	unifacial	metate	---
61	57	---	---	---	sandstone	unifacial	metate	---
77	66	---	---	---	sandstone	unifacial	metate	---
78	67	---	---	---	sandstone	unifacial	metate	---
148	135	230	160	70	sandstone	unifacial	metate	---
158	149	110	90	30	sandstone	unifacial	metate	---
159	150	270	155	45	sandstone	unifacial	metate	---
160	151	200	135	40	sandstone	unifacial	metate	---
161	152	270	210	90	sandstone	unifacial	metate	---

[a]numbers in parentheses are incomplete dimensions; ---, measurement not taken.

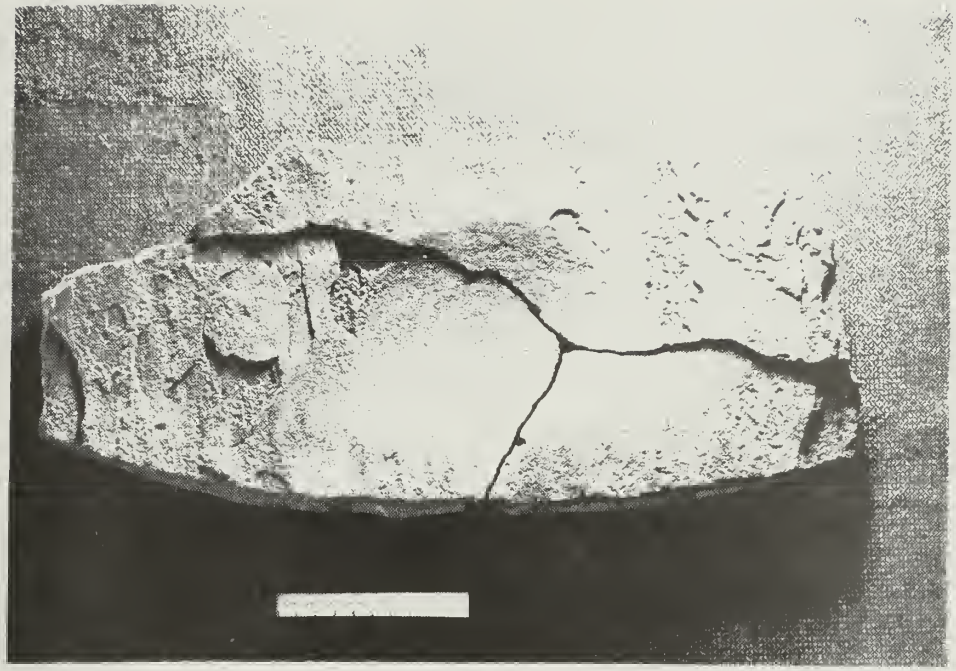


Figure 18. Metate (Cat. No. 32).

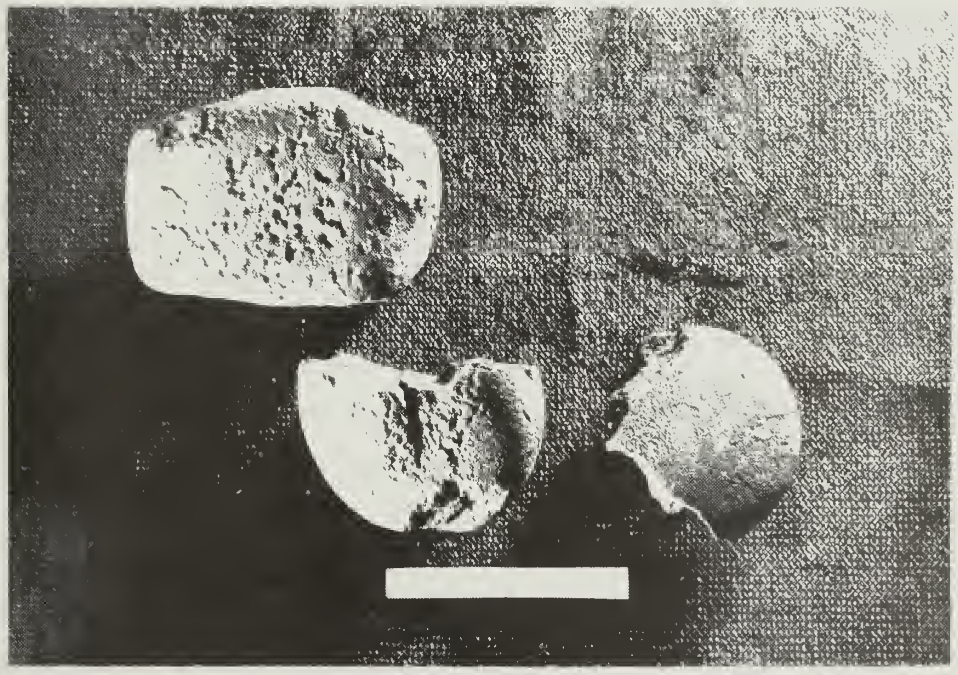


Figure 19. Mano fragments: a, Cat. No. 42; b, Cat. No. 48; c, Cat. No. 54.

one of the specimens are made from a quartzitic sandstone, undoubtedly obtained close at hand from the Dakota sandstone. All of the metates, and most of the manos, have been used on only one face; four specimens, all manos, exhibit bifacial wear. The fragmentary nature of most of the metates suggests the possibility that some were heated for in cooking or roasting (Horn et al. 1987:112).

Historic Artifacts

Several items of protohistoric or historic use or manufacture were recovered from the surface on the south side of the site (see Figure 9). This group includes five metal cans, a metal spoon, a rifle cartridge, a short length of chain, and 12 glass seed beads. Jonathon Horn has examined these protohistoric/historic artifacts and concluded that some, if not all, were deposited by a small group of Utes who probably camped on the site (Appendix C). The date of this historic occupation can be determined with a reasonable degree of confidence to some time between the middle of 1879 and the end of 1881, since the cartridge has a headstamp which indicates that it was manufactured for the military in April 1879. If the individual who used the cartridge was Ute, then this item was probably deposited some time after that date and before the Utes were removed to the reservation in Utah in late 1881. This age assessment is corroborated by the seed beads, which were manufactured for the Indian trade between ca. 1840 and 1890 to 1910, and the short length of chain, which is one of several decorative lengths of chain attached to the sides and underside of a nineteenth century Spanish ring spade bit. The ages of the cans and the spoon cannot be as reliably determined, but Horn believes that they are contemporary, and that they were used and deposited by the same group of Utes.

Features

Two possible features have been identified on the surface of the site. Feature A is located on the north side of the drainage, downslope and slightly east of the shelter (see Figure 9). It consists of a small concentration, less than 1 meter in diameter, of charcoal-stained soil. Feature B is found on the south side of the drainage, at the western end of the site, about 2 meters north of the anthill from which several seed beads (F.S. 6) were recovered. It consists of a semi-circular arrangement of nine sandstone rocks, contained within an area of about 1.6 meters in diameter (Figure 20). A small, corner-notched projectile point (Cat. No. 306; see Table 5 and Figure 14d) was found on top of one of the rocks. No further work was conducted on or near these supposed features during this initial phase of investigations. They have the potential, particularly Feature B, to yield important information on one or more of the site occupations and should be investigated fully during future work at the site.

Rock Art

Six rock art panels are found at the site. Two (Panels A and B) are located behind the shelter, underneath the overhang; the remainder (Panels C through F) are grouped about 12 meters downstream (east) from the rockshelter (Figure 9). A seventh panel is found about 50 meters downstream from the site, and has been recorded as a separate site (5MN3446) (Harris 1988). Sally Cole has studied this rock art, and her results are included as Appendix A. The following discussion of the rock art, what it

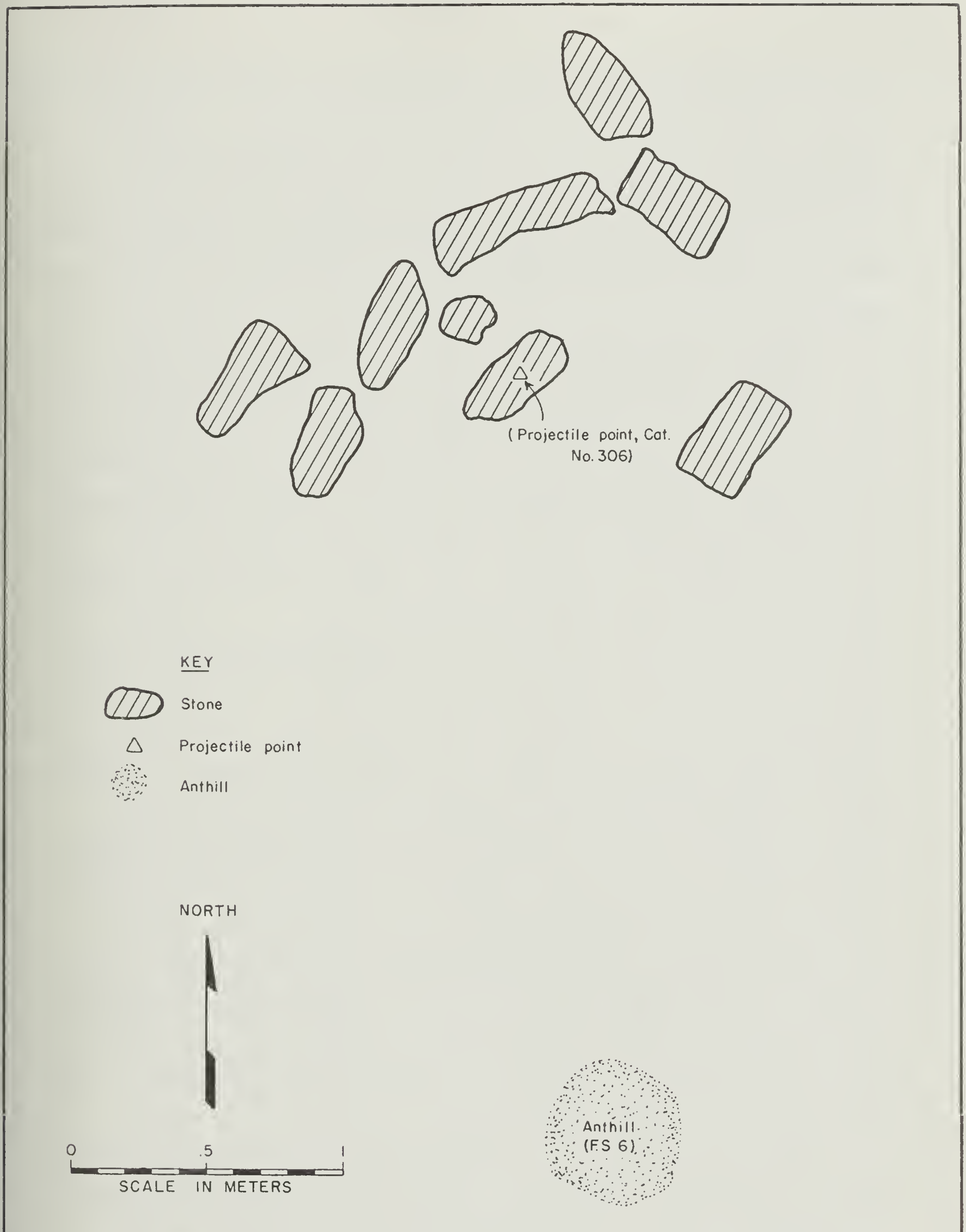


Figure 20. Plan view of Feature B, stone alignment.

contains and how it was made, incorporates much of her interpretations.

Description

Table 12 summarizes the dimensions and contents of each of the six panels; detailed sketches of each panel are provided in Appendix A.

Panel A (Figures 21 and 22) is located on the back wall of the shelter, very close to what was the original ground surface prior to the vandalism. It is long (in fact, the longest panel) and narrow, covering an area of 13,200 square centimeters. The rock face on which it is found faces southeast and leans in slightly towards the shelter. A total of 119 elements has been identified in this panel, most of these consisting of incised lines. Some broader, ground grooves can be found in the upper right-hand area of the panel, and there are curvilinear elements in the lower left-hand corner. Several "bird tracks" are present, and a "one-pole ladder" is located in the lower left-hand corner of the panel. Cole notes (Appendix A:10) that some of the lines in the "one-pole ladder" element are superimposed, suggesting that they were applied more recently than those underneath. The triad images of convergent lines with a longer rear "claw" or "toe" impression, or "bird tracks", are commonly found in rock art on the Colorado Plateau (Appendix A:9).

Panel B (Figure 23) is also located on the back wall of the shelter, several decimeters east of Panel A, and just a few centimeters above the original ground surface. The panel is small, covering an area of only 1,914 square centimeters. Like

Table 12 Descriptions of the Rock Art Panels at the Harris Site

Panel	Dimensions (cm)			Height Above Ground (cm)	No. of Elements[b]						TOTALS (%)
	Height	Width	Inclination[a] (°)		Abst. Curv.	Abst. Rect.	Abst. Comb.	Anth.	Zoom.	Hist.	
A	55	240	75	6	0	115	4	0	0	0	119 (38)
B	29	66	80	12	0	15	0	0	0	0	15 (5)
C	64	59	45	9	0	10	2	0	0	0	12 (4)
D	113	196	75	47	1	62	0	3	1	10	77 (24)
E	96	183	85	29	1	82	0	2	0	3	88 (28)
F	52	28	85	29	0	5	0	0	0	0	5 (2)
TOTALS	--	--	--	--	2	289	6	5	1	13	316
(%)					(<1)	(91)	(2)	(2)	(<1)	(4)	
$\bar{x}$	68	129	74	22	--	--	--	--	--	--	
S.D.	28	80	14	14							

[a]angle of panel, in degrees off horizontal

[b]Abst. Curv., abstract curvilinear; Abst. Rect., abstract rectilinear; Abst. Comb., abstract combination; Anth., anthropomorphic; Zoom., zoomorphic; Hist., historic

Figure 21. Photo of west end of rock art Panel A. Black bar on directional arrow is 10 cm long.

Figure 22. Photo of east end of rock art Panel A. Black bar on directional arrow is 10 cm long.

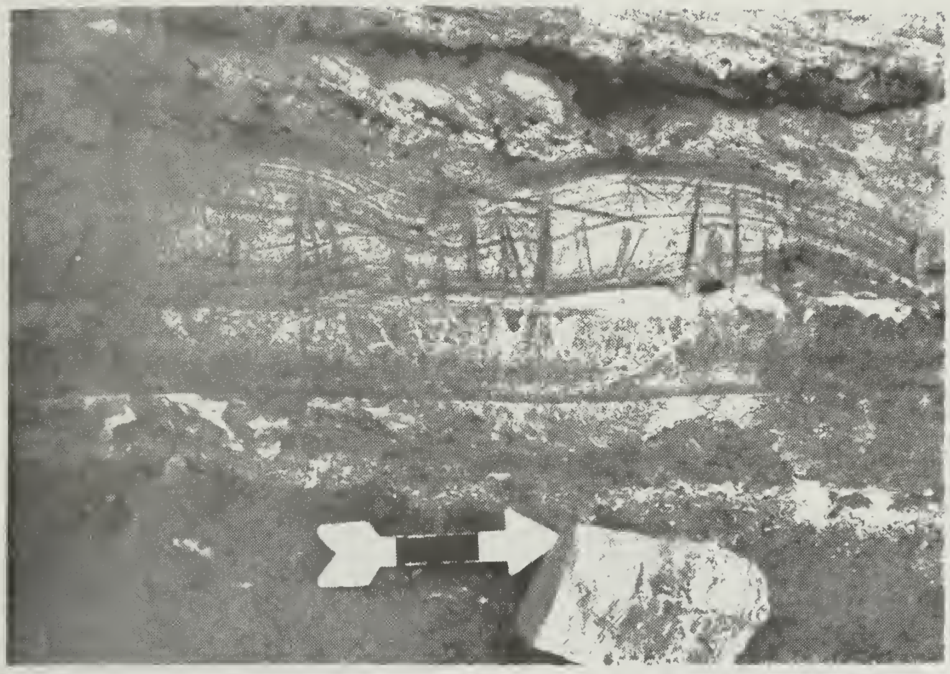


Figure 23. Photo of rock art Panel B. Black bar on directional arrow is 10 cm long.

Figure 24. Photo of upper portion of rock art Panel C. Black bar on directional arrow is 10 cm long.

Panel A, it faces southeast, but it is inclined slightly closer to vertical. It contains 15 elements, consisting of narrow horizontal and vertical incised lines. In the lower left-hand corner, these horizontal and vertical lines are combined to form a cross-hatched element.

Panel C (Figure 24) stands alone, approximately 15-16 meters east of Panels A and B, on a steeply angled section of the cliff face which faces south. The panel contains 12 widely scattered elements within an area of about 3,776 square centimeters. The elements consist of single or joined, narrow incised lines.

Panel D (Figure 25) is the largest and most complex rock art panel found at the site. It covers an area of 22,148 square centimeters on a nearly vertical, south-facing section of the cliff face, approximately 15 meters east of the shelter and 3 meters east of Panel C. It contains 77 individual elements, most of which are narrow incised lines in a variety of patterns, including "bird tracks", cross-hatching, and possible anthropomorphs. The latter appear as stick bodies without heads, and having bent, stick-like appendages. In addition to these probably prehistoric elements, there are several historic representational elements. These include English names and initials ("R.R.", "P.I.T.", "F.A.", "F.H.", and "BULLS"), dates ("1916 APRIL" and "1871"), an outline drawing of a face in profile, and possibly a quadruped. These elements, except possibly the quadruped, are undoubtedly of historic Euroamerican origins, although the accuracy of the 1871 date is uncertain since very few Euroamericans frequented the area before A.D. 1880. According to Cole

Figure 25. Photo of rock art Panel D. Black bar on directional arrow is 10 cm long.

(Appendix A:8), the quadruped resembles bison and horse forms associated with the historic Ute in western Colorado. Buckles (1971) groups these and other forms in the Early Ute Style of rock art, dated between A.D. 1640 and A.D. 1850. If this Ute assignation is correct, then this quadruped could be either a horse with an abstracted rider or a bison with an embedded arrow or spear. Cole acknowledges, however, that this figure could also have been made by Euroamericans since it is near the profiled head, and its grooves are shallow like the head and initials.

Panel E (Figures 26 and 27) is the second largest panel, covering an area of 17,568 square centimeters, and located immediately east of Panel D on a nearly vertical section of the cliff face which faces south. Like Panel D, it contains a variety of element , including abstract grooves, cross-hatched patterns, "bird tracks", anthropomorphs, and historic elements. The grooves in Panel E, however, are wider and slightly deeper than those in Panel D. The historic elements consist of the same "P.I.T." initials found in Panel D, and undoubtedly made by the same individual.

Panel F (Figure 28) is the easternmost panel, located a few centimeters east of Panel E, on a south-facing, nearly vertical section of the cliff face. It is the smallest panel, covering an area of only 1,456 square centimeters and containing only 5 elements. These elements consist of four separate broad grooves and one pattern with several convergent grooves.

The abstract incised grooves in the petroglyphs at the Harris Site are considered by Cole to be prehistoric in origin, although

Figure 26. Photo of west end of rock art Panel E.

Figure 27. Photo of east end of rock art Panel E.

Figure 28. Photo of rock art Panel F.

some of the zoomorphic elements (e.g. the quadrupeds) were probably made by Proto-historic or Historic Ute Indians. She believes that most of the highly abstract incised and ground elements fall within the Uncompahgre Style category of rock art, dated in the region between approximately 1000 B.C. and A.D. 1300 (Cole 1987:54). They are clearly related to Uncompahgre Style petroglyphs found at other sites throughout west-central Colorado.

Manufacture

Petroglyphs can be made in three ways: by pecking, grinding, or incising, or by a combination of these techniques. According to Cole, the petroglyphs at the Harris Site are "...either incised or ground and appear as individual grooves, groupings of the same and representational images. Incised grooves are narrow and sharp, and ground grooves are wider and approximately elliptical in shape." (Appendix A:3). She discusses at some length on the question of whether or not the grooves in the petroglyphs at the Harris Site are the incidental result of the modification of bone and antler tools, or purposely placed there as rock art images. She concludes that the latter explanation is more likely for the following reasons: (1) there are very few examples of repetitious individual parallel grooves and fan-like arrangements of the elements which would result from tool modification; (2) there are patterned as well as more random groupings of grooves; (3) there are both abstract geometric designs and representational elements; and, (4) the petroglyphs are technically and stylistically consistent with pecked and incised rock found at other sites in west-central Colorado (Appendix A:5).

How then were these incised and ground grooves made? According to Cole, they could have been made with stone flakes, modified bone, or antler. No worked or modified bone or antler were found during the excavations at the site. Their absence does not, of course, rule out the possibility that these materials were used since so little of the site's deposits have been excavated. The recovery of a large modified stone flake form the vandal's refuse pile supports the idea that stone tools were used to make the grooves, however. This flake (Cat. No. 45), made from some type of igneous material, possibly basalt, has been smoothed and abraded on both ends, both margins, and both faces (see Figure 12). The wear patterns on this flake correspond exactly to the kind of wear one would expect to find in an implement that was applied repeatedly in short strokes across relatively soft, but abrasive sandstone.

Further support for the idea that Cat. No. 45 was used as a rock art incisor comes from archaeological evidence gathered at the nearby Moore Site. The rock art at this site, located only a few miles away, are very similar to those at the Harris Site. In addition, the researchers recovered a quartzite flake from the excavations at the Moore Site which had "one extraordinarily smooth edge", and which was experimentally shown to have made the grooves at the site (Wormington and Lister 1956:8-9). In the absence of other evidence, we must conclude that the rock art at the Harris Site was placed there for artistic rather than utilitarian reasons.

Excavated Materials

Three test units were excavated at the Harris Site. Units 95N, 99E and 95N, 100E are contiguous one meter square units, placed at the top of the slope in front of the rockshelter; 92N, 106E is a partial unit, located at the edge of the drainage channel so as to expose a continuous sequence of the site's natural and cultural stratigraphy (see Figure 9). As described in Chapter 5, each unit was excavated in arbitrary 10 cm levels, the dirt was screened, and all artifacts and ecofacts recovered from the screen. The total volume of dirt which was removed from the three units is slightly more than 3 cubic meters (Table 13).

Table 13 Volumes of Dirt Removed from Test Units

Test Unit	Size	Depth	Volume
95N, 99E	1m x 1m	1.2m	$1.2m^3$
95N, 100E	1m x 1m	1.3m	$1.3m^3$
92N, 106E	0.5m x 1m	1.4m	$0.7m^3$
		TOTAL VOLUME	$3.2m^3$

This section describes in detail the results of the test excavations. The discussion includes the stratigraphy and chronology of each unit, the kinds and numbers of recovered artifacts and ecofacts, and cultural features. Chapter 7 consolidates the results from each test unit to obtain a general interpretation of site formation processes, chronology, and lifeways of the aboriginal inhabitants.

Test Units 95N, 99E and 95N, 100E

Because these two units are contiguous, they are treated as one in the following discussion. The proveniences of the data are appropriately identified, however.

Stratigraphy and Chronology

Unit 95N, 99E was excavated to a depth of 120 cm below datum, while Unit 95N, 100E was excavated to 130 cm below datum. The datum for each unit was established in its northwest corner. The absolute elevation of each datum was 1770.34 and 1770.21 meters above sea level for Unit 95N, 99E and Unit 95N, 100E, respectively. A combined profile sketch of the south walls of the two units (Figure 29) displays four distinct strata; Table 14 describes these strata.

Table 14 Strata Identified in Test Units 95N, 99E and 95N, 100E

Stratum	(Munsell)	Description
1	dark brown (10 YR 3.3)	Very fine silty sand with numerous angular sandstone cobbles and charcoal fragments; loose and friable
1a	light yellowish brown (10 YR 6/4)	Gravel lens
2	brown (10 YR 5/3)	Silty sand with scattered bits of charcoal and sandstone gravels; loose and dry
2a	brown (10 YR 5/3)	Lens of silty sand and fine gravels

Strata 2 and 2a are the vandal's backdirt piles: Stratum 2 is the fine material which passed through the screen, and Stratum

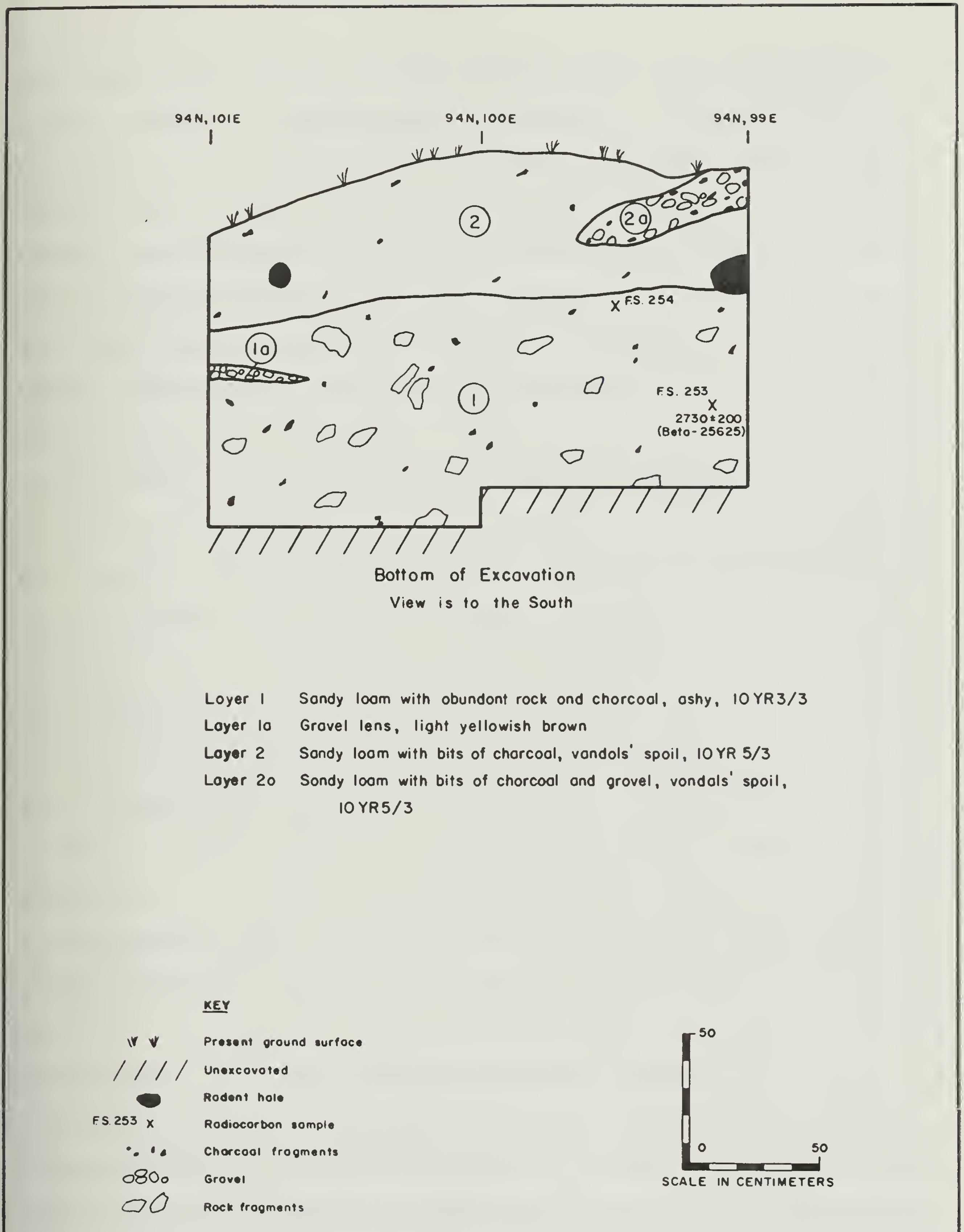


Figure 29. Profile sketch of the south walls of Test Units 95N, 99E and 95N, 100E.

2a is probably the larger gravels which remained in the screen and were later dumped. Stratum 1 is, in contrast, cultural midden, replete with charcoal, artifacts, ecofacts, and angular rock fragments. It is relatively homogeneous, i.e. no fine intergradations could be discerned. I suspect that this layer accumulated as a result of both cultural and natural processes: the prehistoric inhabitants tossed their trash on the slope below the shelter, and these materials commingled with and were later covered by colluvial slope wash. Stratum 1a is a fine gravel stringer, probably deposited there by moderate energy fluvial action.

Subsequent to the test excavations, and prior to backfilling the units, a soil probe was made in the northwest corner of Unit 95N, 100E to a depth of 228.5 cm below datum. No change in Stratum 1 was noted until about 160 cm BD. At this depth, the soil color is more yellow (10 YR 4/3) than the soil above it, but it still contained charcoal. At the bottom of the soil probe, the color changes again, to 10 YR 7/6 or 7/8, and the charcoal disappears. It is likely that this is the top of the natural deposits which underlay the cultural midden. The relationship of the natural and cultural deposits are better clarified in Unit 92N, 106E.

A charcoal sample was collected from the south wall of Unit 95N, 99E and submitted to Beta Analytical, Inc. for radiocarbon age determination; Table 15 presents the results of this analysis. According to the established cultural historical sequence for west-central Colorado (see Figure 6), the calibrated age range of this sample places the associated occupation within the Middle Period of the Archaic of the Uncompahgre Technocomplex (Horn et al. 1987). The radiocarbon age also closely matches a 2695±180 BP (Beta-12980) date obtained from Level 5 at the Shavano Spring Site (5MN40), which corresponds to the Roubideau Phase of the Uncompahgre Plateau Cultural Historical Sequence (Buckles 1985). As discussed below, this age assessment supports the interpreted age ranges of several projectile point types collected from the units.

Table 15 Radiocarbon Age Determination for Charcoal Sample Collected from Test Unit 95N, 99E

Lab No.	F.S. No.	Cat. No.	Measured Depth[a]	Actual Depth[b]	C-14 Age (Years BP)	Calibrated Age Range (± 1 Std. Dev.)[c]
eta-25625	253	291	86	40	2730±200	3159-2612 BC (1210-663 BP)

[a]in centimeters below unit datum

[b]in centimeters below original (pre-vandalism) ground surface

[c]Stuiver and Becker (1986)

Artifacts

A total of 5,610 artifacts was collected from the excavations in Test Units 95N, 99E and 95N, 100E. Table 16 summarizes the type and numbers of artifacts for each excavation level. Approximately 52 percent of these artifacts were collected from Unit 95N, 100E; the other 48 percent came from Unit 95N, 99E. The overwhelming majority (98 percent) of these artifacts are debitage. Of the remaining artifacts, about three-fourths are

Table 16 Summary of Artifacts Collected from Test Units 95N, 99E and 95N, 100E

			Artifact Type	0	1	2	3	4	5	6	7	8	9	10	11	12	13	TOTALS
				Excavation Levels														
				Vandal's Backdirt					Midden									
CHIPPED STONE	Prepared Tools	Bifacial Tools	Roughout	0	0	0	0	0	0	0	2	1	0	4	0	0	1	8
			R.P. Blank	0	0	0	0	0	1	0	1	2	0	0	0	1	1	6
			F.P. Blank	0	0	1	0	0	0	0	1	1	3	2	1	2	0	11
			Preform	0	0	0	0	0	0	1	1	0	1	1	2	0	0	6
			Proj. Point	0	0	0	0	0	0	1	2	1	1	2	2	2	0	11
			Knife	0	0	0	0	0	0	0	0	0	0	1	0	1	0	2
		Unifacial Tools	Scraper	0	0	0	0	0	1	0	4	0	0	1	0	2	0	8
			Scraper Plane	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	By-Products of Tool Manu-facture		Core	0	0	0	0	0	1	1	1	0	3	3	1	4	0	14
			Debitage	13	49	154	91	56	156	384	649	537	725	1163	411	719	404	5511
	Expedient Tools		Hammerstone	0	0	0	0	0	0	0	1	0	0	1	0	1	0	3
			Chopper	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			Util. Flake	0	0	1	0	0	1	1	0	0	0	1	0	2	1	7
GROUND STONE			Metate	3	0	1	0	0	0	1	0	0	1	2	0	3	0	11
			Mano	0	0	0	0	0	0	1	4	1	1	0	4		1	15
			TOTALS	16	49	157	91	56	160	390	666	543	735	1181	421	740	408	5613
			(%)	(0.3)	(0.9)	(2.8)	(1.6)	(1.0)	(2.8)	(6.9)	(11.9)	(9.7)	(13.1)	(21.0)	(7.5)	(13.2)	(7.3)	(100.0)

chipped stone and the rest are ground stone. Bifacial tools are the most numerous chipped stone artifacts, comprising 60 percent of that total, excluding the debitage. The remaining chipped stone artifacts are more or less evenly divided among unifacial tools, cores, and expedient tools.

A sharp increase in the relative frequencies of all artifacts in these two units occurs in Level 5 (Figure 30). Not coincidentally, this is the approximate depth at which the cultural midden begins, the materials above that level belonging to the vandal's backdirt pile. The frequencies of artifacts increase markedly up through Level 10 (within which the radiocarbon sample was taken), and then begin to taper off.

Chipped Stone

Bifacial Tools

Detailed measurements and descriptions of the bifacial tools, excluding the projectile points, are given in Table 17; selected examples are illustrated in Figures 10 and 11. The earlier stages of biface manufacture, particularly the fine-percussion blanks, are well-represented. The relative frequencies of tools made from quartzite are low, comprising 30 percent of all tools, while the cryptocrystalline silicates, chert and chalcedony, are substantially more numerous (70 percent). The quartzites are mostly gray or gray-brown in color; the cherts and chalcedonies, however, show more variations in color, from gray or gray-brown, through red-brown or yellow-brown, to brown. As expected, the size of a tool is directly related to stage of manufacture (Table 18); that is, roughouts are larger than rough-percussion blanks,

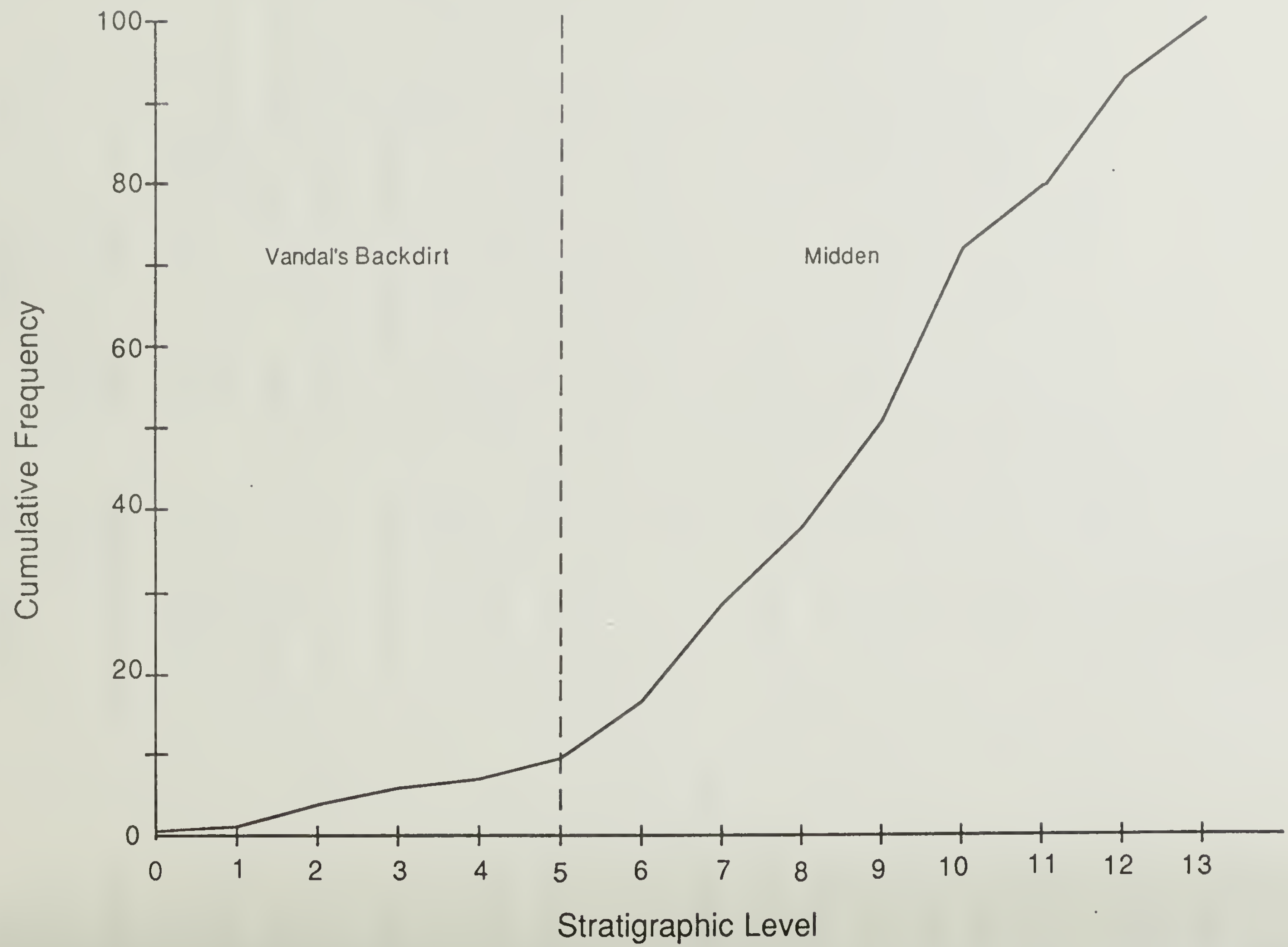


Figure 30. Cumulative frequency polygon of all artifacts by excavation level in Test Units 95N, 99E and 95N, 100E.

Table 17 Morphological Characteristics of Bifacial Tools Collected from Test Units 95N, 99E and 95N, 100E[a]

Cat. No.	F.S. No.	Unit	Level	Linear Measurements (mm)[b] Length (L)	Width (W)	Thickness (Th)	Th/W Ratio[b]	Weight[b] (gm)	Material	Mfg. Stage[c]	Illustration
97	86	95N, 100E	2	(66.0)	(43.0)	5.8	0.135	(13.3)	chert	F.P. blank	- - -
120	109	95N, 100E	6	(91.8)	(55.5)	11.3	0.204	(47.0)	quartzite	preform	- - -
127	116	95N, 99E	5	(53.8)	(23.6)	7.2	0.305	(11.6)	chert	R.P. blank	- - -
145	132	95N, 100E	7	39.6*	28.5*	7.3	ind.	(13.2)	chert	preform	- - -
172	159	95N, 100E	8	55.8	43.3	15.1	0.349	35.4	chert	roughout	Fig. 10e
173	162	95N, 99E	7	(47.4)	25.8	10.6	0.411	(11.3)	quartzite	roughout	Fig. 11a
174	174	95N, 99E	7	(50.7)	46.6	15.0	0.322	36.8	chert	roughout	Fig. 11c
178	197	95N, 99E	10	(50.6)	22.0	6.0	0.273	(3.8)	chalcedony	knife	Fig. 10b
180	201	95N, 100E	10	(83.8)	(31.7)	5.6	0.177	(12.5)	chert	preform	- - -
182	207	95N, 99E	10	60.5	47.0	19.6	0.417	(47.2)	quartzite	roughout	Fig. 10d
185	168	95N, 100E	9	(67.3)	(26.9)	6.7	0.249	(9.8)	chert	F.P. blank	- - -
190	178	95N, 99E	8	ind.	ind.	9.0	ind.	(44.0)	quartzite	R.P. blank	- - -
193	148	95N, 100E	8	(79.5)	(42.0)	5.5	0.131	(12.0)	quartzite	R.P. blank	- - -
200	156	95N, 99E	7	(50.8)	28.9	8.2	0.284	(14.6)	chalcedony	R.P. blank	- - -
206	196	95N, 99E	10	(100.8)	(49.0)	14.9	0.304	(69.5)	chert	roughout	- - -
208	156	95N, 99E	7	(60.8)	(34.0)	6.8	0.200	(8.8)	chalcedony	F.P. blank	- - -
225	160	95N, 100E	9	(72.3)	(21.3)	6.2	0.291	(5.3)	chert	F.P. blank	- - -
226	160	95N, 100E	9	(55.2)	18.0	6.7	0.372	(7.0)	chalcedony	F.P. blank	- - -
227	192	95N, 99E	9	(75.2)	(54.4)	5.9	0.108	(18.4)	quartzite	preform	- - -
230	199	95N, 100E	10	(52.0)	(41.0)	6.4	0.156	(8.8)	quartzite	F.P. blank	- - -
240	210	95N, 100E	11	(35.0)	(27.6)	6.1	0.221	(4.2)	chert	F.P. blank	- - -
241	211	95N, 99E	11	(48.0)	18.4	4.9	0.266	(6.2)	chert	preform	- - -
243	213	95N, 100E	12	(69.7)	(44.0)	9.3	0.211	(18.0)	quartzite	F.P. blank	- - -
261	228	95N, 99E	11	(44.0)	23.1	6.4	0.277	(8.2)	chert	preform	- - -
272	235	95N, 100E	13	83.4	43.9	24.4	0.556	83.0	quartzite	roughout	- - -
273	256	95N, 100E	13	(92.0)	(57.7)	11.0	0.191	(67.6)	quartzite	R.P. blank	- - -
278	240	95N, 99E	12	(43.4)	26.1	5.2	0.199	(7.0)	chert	F.P. blank	- - -
296	148	95N, 100E	8	(36.6)	23.4	6.1	0.261	(6.8)	chert	F.P. blank	- - -
298	191	95N, 100E	10	ind.	ind.	5.7	ind.	(15.0)	chert	F.P. blank	- - -
300	196	95N, 99E	10	90.5	(68.5)	23.5	0.343	39.3	chert	roughout	- - -
301	196	95N, 99E	10	71.0	38.5	15.2	0.395	21.4	chalcedony	roughout	- - -
302	230	95N, 99E	12	ind.	ind.	4.4	ind.	(2.7)	chert	biface	- - -
303	230	95N, 99E	12	(40.0)	26.5	5.6	0.211	(6.8)	chert	R.P. blank	- - -

[a] does not include projectile points

[b] ( ), estimated dimension; ind., indeterminate dimension; *, incomplete dimension

[c] R.P., rough percussion; F.P., fine percussion

rough percussion blanks are larger than fine-percussion blanks, etc.

Table 18 Mean Dimensions of Bifacial Tool Categories from Test Units 95N, 99E and 95N, 100E

Artifact Category	N	Mean Length (mm)	Mean Width (mm)	Mean Thickness (mm)	Mean Th/W Ratio (mm)	Mean Weight (gm)
roughout	8	70.0	45.3	17.3	0.387	43.0
R.P. blank	5[a]	63.2	35.7	7.5	0.224	22.5
F.P. blank	10[a]	55.8	30.5	6.5	0.230	8.9
preform	5[a]	68.6	36.6	6.8	0.206	18.5
knife	1[a]	50.6	22.0	6.0	0.273	3.8

[a]includes only complete specimens, or those with estimated dimensions

Is there any variation in the morphological characteristics of the bifacial tools through time, from top to bottom in the excavation units? Very little change is apparent in material type: cherts are most numerous throughout the cultural midden (i.e. Level 5 and deeper), attaining slightly greater frequencies in Levels 10-12. With artifact size and manufacturing stage, however, a subtle but interesting pattern emerges. Figure 31 compares the overall artifact size, as measured by the thickness/width ratio, with stratigraphic level for each of the manufacturing stage categories. The most obvious pattern is that most of the artifacts are clustered in Levels 7 to 12 and exhibit a broad variation in size. There is a hint, however, that artifact size increases with depth, or time. This statement can be treated as a hypothesis which can be tested statistically using

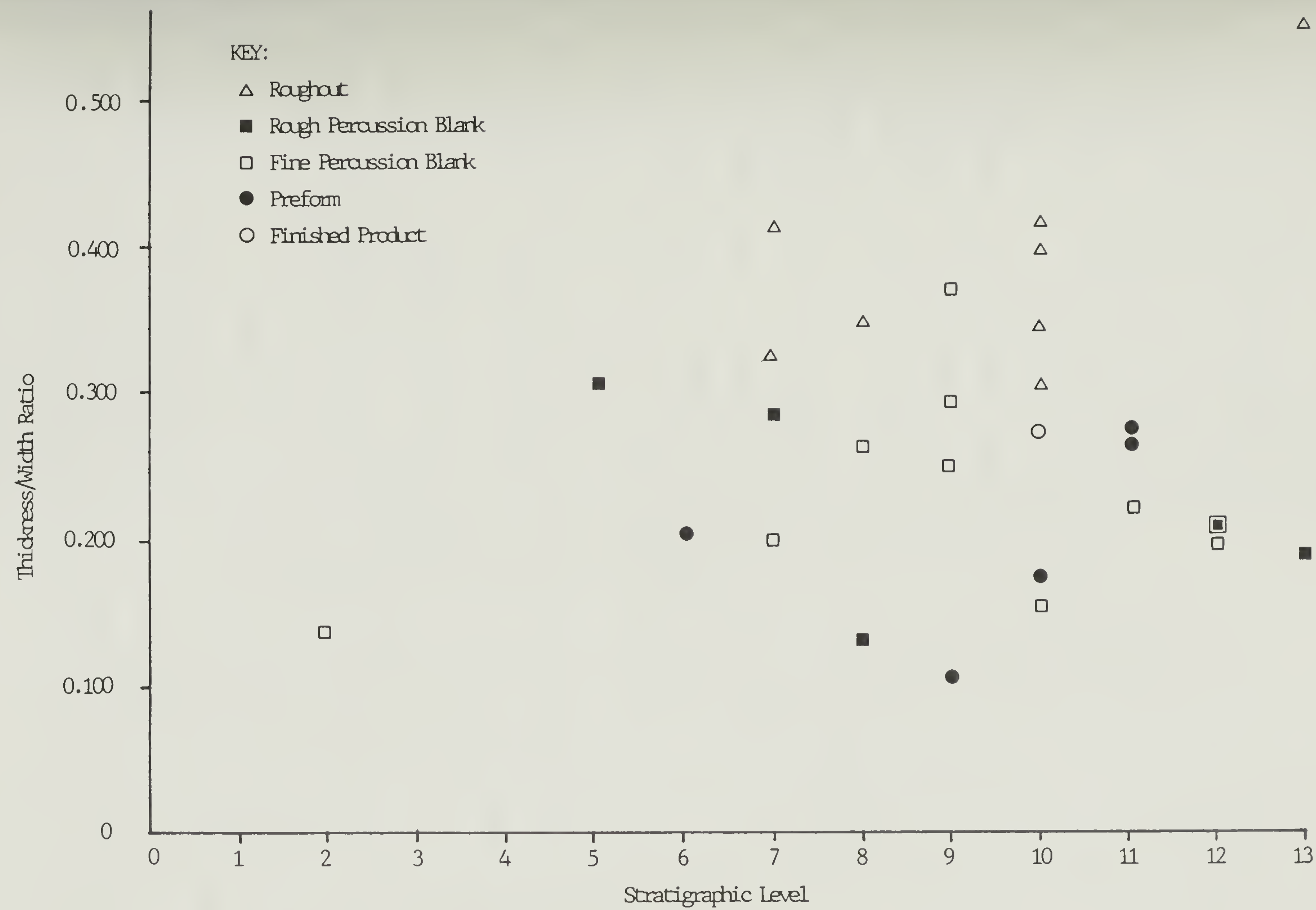


Figure 31. Comparison of artifact size with stratigraphic level for bifacial tools collected from Test Units 95N, 99E and 95N, 100E.

the correlation coefficient (cf. Thomas 1976:383-394). The null hypothesis (H_0) is that there is no correlation between artifact size and stratigraphic level in the population from which these samples of artifacts are drawn. The alternative hypothesis (H_1), of course, is that there is a significant correlation. For all the artifacts (n=28), the correlation coefficient is very low (r=0.16, df=26, p>.10), and H_0 cannot be rejected. The coefficients of the four manufacturing stages are also not significant but are individually larger than the whole group: <u>roughouts</u>, r=0.63, n=8, df=6, .10>p>.05; <u>R.P. blanks</u>, r=-0.54, n=5, df=3, p>.10; <u>F.P. blanks</u>, r=0.25, n=10, df=8, p>.10; and <u>preforms</u>, r=0.42, n=5, df=3, p>.10. It is interesting to note that whereas roughouts, F.P. blanks, and preforms increase in size with depth (i.e. time), R.P. blanks <u>decrease</u> in size. Overall, we can conclude from this exercise that there is continuity in biface size through time.

The majority of the projectile points recovered from the site came from these two test units. Table 19 describes the morphological characteristics of these projectile points; Figure 32 illustrates the more complete specimens. Unlike the few projectile points recovered from the surface of the site, nearly two-thirds of the points recovered from these two units are made of cryptocrystalline materials (chert or chalcedony). Most of the quartzite pieces came from Unit 95N, 99E. Of those specimens whose overall shape can be determined, most are small to medium-sized corner-notched varieties. Two of the small varieties (Cat. Nos. 146 and 157) have elongated blades and notches set low on the

Table 19 Morphological Characteristics of Projectile Points Collected From Test Units 95N, 99E and 95N, 100E

		Provenience		Linear Measurements[a]						Shoulder Angles[b]		Weight[c]			
Cat. No.	F.S. No.	Unit	Level	Max. Length	Axial Length	Max. Width	Basal Width	Neck Width	Thickness	DSA	PSA	Actual	Est.	Material	Type[d]
146	132	95N, 100E	7	27.5	27.5	12.2	7.6	5.5	2.7	145	104	0.8	0.8	chalcedony	R
149	136	95N, 100E	7	38.3	38.3	(22.8)	10.4	8.8	5.2	134	103	2.9	3.7	quartzite	7
156	145	95N, 99E	6	(27.0)	(27.0)	15.8	6.5	6.2	3.7	167	108	1.1	1.2	chalcedony	8
157	146	95N, 100E	8	(32.1)	(32.1)	(12.7)	7.1	6.5	3.1	147	106	1.1	1.2	chalcedony	R
177	182	95N, 100E	9	24.1	24.1	16.3	8.5	7.6	3.5	180	93	1.1	1.1	chert	8
179	200	95N, 100E	10	(60.8)	(58.2)	26.6	22.0	NA	4.3	NA	NA	4.8	8.7	chert	P
204	196	95N, 99E	10	inc.	inc.	22.9	inc.	inc.	3.3	inc.	inc.	1.6	2.7	quartzite	A
249	218	95N, 100E	12	inc.	inc.	inc.	15.0	12.8	4.0	230	97	0.7	3.5	chert	EC
255	222	95N, 99E	11	(25.5)	(25.5)	(22.5)	(13.8)	11.1	3.4	155	114	0.6	1.5	chert	EC
256	223	95N, 99E	11	inc.	inc.	inc.	15.8	14.2	3.0	223	110	0.5	2.5	quartzite	?
276	238	95N, 99E	12	(61.0)	(61.0)	25.2	18.1	NA	6.2	NA	NA	3.0	10.0	quartzite	P

[a] measurements in millimeters; NA, not applicable; inc., incomplete dimension; ( ), estimated dimension

[b] in degrees: DSA, distal shoulder angle; PSA, proximal shoulder angle

[c] in grams

[d] R, Rosegate Series; 7, Buckles' Type 7; 8, Buckles' Type 8; EC, Elko Corner-notched; A, Archaic; P, Paleoindian; ?, unknown

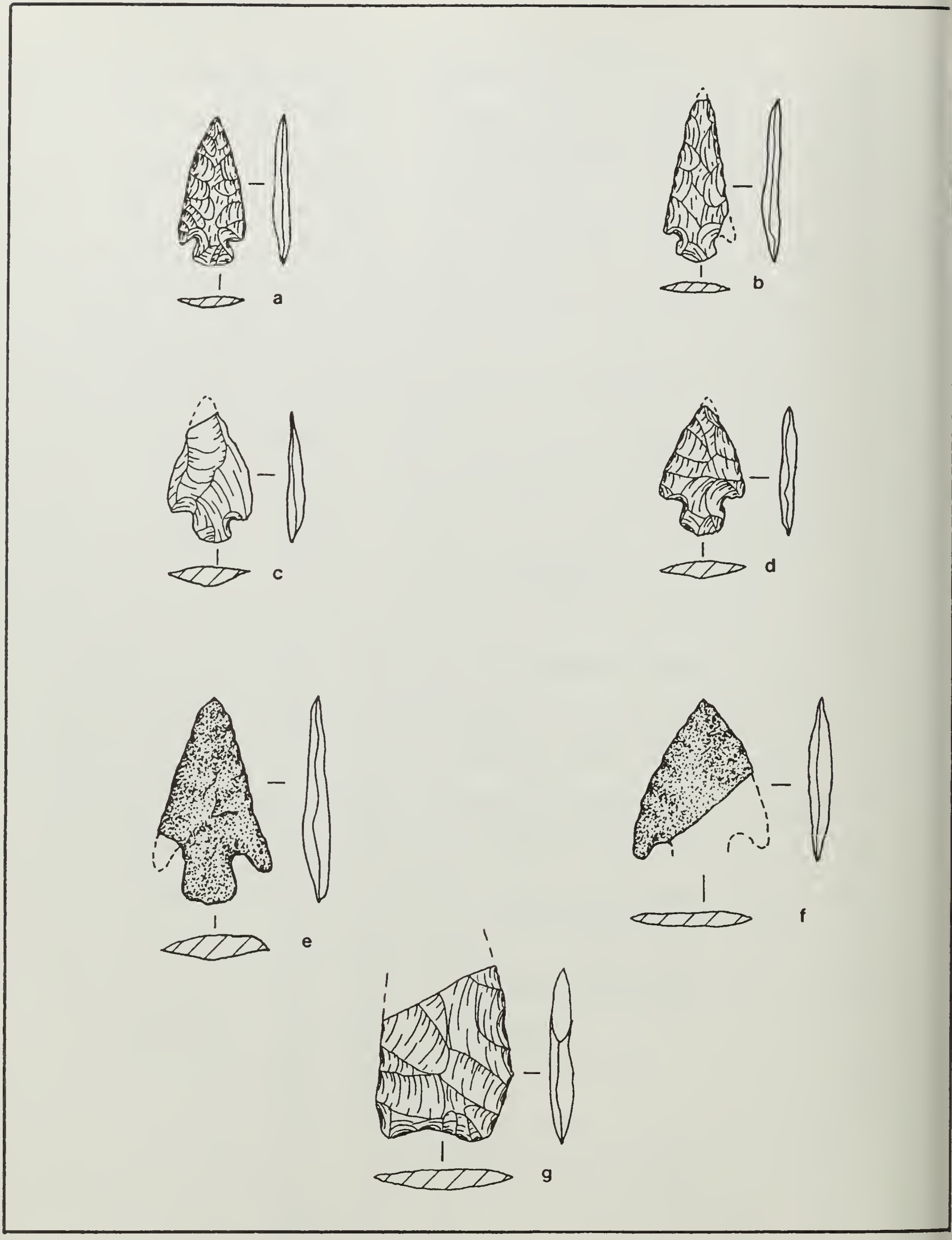


Figure 32. Projectile points: a, Cat. No. 146; b, Cat. No. 157; c, Cat. No. 156; d, Cat. No. 177; e, Cat. No. 149; f, Cat. No. 204; g, Cat. No. 179.

body (Figs. 32a and 32b). They closely resemble types commonly referred to as Rose Spring or Eastgate, but which have been combined into a single form called Rosegate series (Holmer 1986:106-107). In the eastern portion of the Intermountain West region, Rosegate points appear after A.D. 300 and last until about A.D. 900 (Holmer 1986:107). They herald the adoption of the bow and arrow. The other three small corner-notched points (Cat. nos. 149, 156, and 177) have blunter blade sections and slightly excurvate margins, with notches that are set slightly higher up the base, high enough almost to give the appearance of being stemmed (Figs. 32c, 32d, and 32e). These points resemble Types 7 or 8 of the Uncompahgre Complex Sequence, which are usually associated with the Coal Creek Phase, dated between A.D. 700 and 1300 (Buckles 1971:1220). The co-occurrence of these two types of small corner-notched points place a relative date of approximately A.D. 700-900 to the upper levels of the cultural deposits. Except for Cat. No. 177, these points are stratigraphically superior to, and appropriately postdate, the radiocarbon age estimate of 2730±200 BP.

The two medium-sized corner-notched points (Cat. Nos. 249 and 255) are incomplete, but closely resemble the Elko Corner-notched type. As mentioned above, this type spans the entire Archaic Stage, from about 6000 B.C. to A.D. 1000 (Holmer 1986:102). These two points, along with two other fragmentary specimens (Cat. Nos. 204 and 256), were recovered from levels below the radiocarbon date, and suggest an Archaic-age occupation.

The remaining two points are somewhat unique. Both are the basal portions of what were probably lanceolate-type projectile points. One specimen (Cat. No. 179) is very thin and flat, and has a slightly concave base which has been thinned by pressure flaking (Fig. 32g). It resembles very closely the point fragment (Type 43) recovered by Buckles from Level 9b at Christmas Rock Shelter (5DT2) on the Uncompahgre Plateau, which he asserts compares favorably with the late Paleoindian, or Plano Tradition, Midland type points (Buckles 1971:170). He hesitantly defines around this single artifact, a cultural phase, the Buttermilk Assemblages, dated approximately 8000 B.C. to 3000 B.C. (Buckles 1971:1295). In contrast, the other lanceolate-type projectile point fragment (Cat. No. 276) has a thinned, straight base, expanding blade margins, and a slightly thicker, plano-convex profile. It has morphological affinities with some of the Plano Tradition Agate Basin Complex points of eastern Colorado and Wyoming, such as Hell Gap and Agate Basin (Cassells 1983). It was recovered from a proper stratigraphic position: in the deepest excavated level of Unit 95N, 99E, below the Archaic specimens and the radiocarbon date. The Midland type point, however, was recovered from Level 10 of Unit 95N, 100E, stratigraphically superior to an Archaic-type point (Cat. No. 249). It is possible that Cat. No. 179 was reused, and discarded, by the Archaic occupants of the site.

Unifacial Tools

Eight unifacial tools were recovered from the two excavation units. Their morphological characteristics are described in Table

20. All are classified as scrapers, although Cat. No. 176 exhibits some battering on the proximal end, suggesting it was also used as a chopping tool. Secondary use is evident as step fracturing and micro-scarring along an end or margin. The average dimensions of this sample of scrapers are shown at the bottom of the table. Compared to the specimens collected from the site surface (see Table 7), the scrapers from these two units are smaller and much lighter, especially if the two largest artifacts (Cat. Nos. 176 and 181) are removed and the average values adjusted accordingly.

By-products of Tool Manufacture

The by-products of tool manufacture, cores and debitage, comprise by far the greatest number (98 percent) of the artifacts recovered from the two test units. Fourteen cores were found, over half of them from Unit 95N, 99E. Their morphological characteristics are described in Table 21. Quartzite is the preferred raw material, but not overwhelmingly so. Compared to the cores found on the site surface (see Table 8), those found in the test units are only slightly smaller, but are much heavier. With just a few exceptions, these cores appear to have been worked to exhaustion.

A total of 5,511 pieces of debitage was collected from the two test units. About 95 percent of this total are flakes, the remainder are angular debris. The vertical distribution of debitage in each test unit is summarized in Table 22. In both units, the relative frequencies of debitage is low up through Level 5, at which point the numbers increase noticeably. This

Table 20 Morphological Characteristics of Unifacial Tools Collected from Test Units 95N, 99E and 95N, 100E

Cat. No.	F.S. No.	Provenience Unit	Provenience Level	Linear Measurements (mm) Length	Width	Thickness	Weight (g)	Material	Type
138	127	95N, 99E	5	38.8	31.4	11.2	14.9	chalcedony	scraper
151	138	95N, 100E	7	55.6	33.3	6.1	16.6	quartzite	scraper
154	142	95N, 100E	7	39.0	31.6	13.1	17.4	chalcedony	scraper
171	157	95N, 99E	7	41.7	29.1	16.7	15.7	chert	scraper
176	176	95N, 99E	7	75.9	61.5	23.9	99.1	quartzite	scraper, chopper
181	203	95N, 99E	10	66.2	63.6	16.7	60.5	quartzite	scraper
294	209	95N, 100E	12	42.2	25.1	6.7	7.9	chalcedony	scraper
304	230	95N, 99E	12	51.3	38.4	9.5	19.4	chalcedony	scraper
			Means =	51.3	39.2	13.0	31.4		
			Std. Dev. =	13.8	14.9	6.0	31.8		
			Adjusted Means[a] =	44.8	31.5	10.6	15.3		
			Adjusted Std. Dev.[a] =	7.0	4.4	4.0	3.9		

[a]excludes Cat. Nos. 176 and 181

level is the approximate depth at which the original cultural midden begins, the levels above being the vandal's backdirt pile. The greatest percentage of debitage occurs in Level 10 of both units; bifacial tool manufacture was emphasized during this phase in the occupational history of the site, i.e. prior to ca. 2700 BP based upon the C-14 date from Level 9 of Unit 95N, 99E.

Table 21 Morphological Characteristics of Cores Recovered from Test Units 95N, 99E and 95N, 100E

Cat. No.	F.S. No.	Provenience Unit	Level	Linear Measurements (mm) Length	Width	Thickness	Weight[a] (g)	Material
140	128	95N, 99E	5	50	35	30	N.M.	chalcedony
155	143	95N, 99E	6	110	105	70	N.M.	quartzite
175	170	95N, 99E	7	47.2	34.2	20.9	48.5	chert
203	196	95N, 99E	10	(75.5)[b]	56.3	33.8	135.4	quartzite
211	191	95N, 100E	10	60	50	55	N.M.	quartzite
213	169	95N, 100E	9	90	55	55	N.M.	quartzite
214	193	95N, 99E	9	90	70	45	N.M.	quartzite
215	195	95N, 99E	9	80	45	55	N.M.	quartzite
231	202	95N, 99E	10	165	125	65	N.M.	quartzite
236	209	95N, 100E	12	67.9	34.1	22.0	65.8	chert
237	209	95N, 100E	12	33.2	43.6	18.2	28.2	chert
238	209	95N, 100E	12	105.2	58.6	29.2	141.9	igneous
252	219	95N, 99E	11	48.0	40.2	26.2	48.3	chert
264	230	95N, 99E	12	95.3	62.0	38.3	171.3	quartzite
			Means =	79.8	58.1	40.3	91.3[c]	
			Std. Dev. =	33.9	26.7	17.2	56.6[c]	

[a]N.M., no measurement taken

[b]( ), estimated dimension

[c]for weight, N = 7

Looking at the material types and size of the debitage collected from the two test units (Table 23), small flakes account for slightly more than two-thirds of the total, and material types

Table 22 Vertical Distribution of Debitage in Test Units 95N, 99E and 95N, 100E

	Level	Unit 95N, 99E N	Unit 95N, 99E Pct.	Unit 95N, 99E Cum. Pct.	Unit 95N, 100E N	Unit 95N, 100E Pct.	Unit 95N, 100E Cum. Pct.	TOTALS N	TOTALS Pct.	TOTALS Cum. Pct.
Vandal's Backdirt	0	7	0.3	0.3	6	0.2	0.2	13	0.2	0.2
	1	42	1.6	1.9	7	0.2	0.4	49	0.9	1.1
	2	127	4.8	6.7	27	0.9	1.3	154	2.8	3.9
	3	83	3.1	9.8	8	0.3	1.6	91	1.7	5.6
	4	38	1.4	11.2	18	0.6	2.2	56	1.0	6.6
Midden	5	101	3.8	15.0	55	1.9	4.1	156	2.8	9.4
	6	182	6.9	21.9	202	7.1	11.2	384	7.0	16.4
	7	305	11.5	33.4	344	12.0	23.2	649	11.8	28.2
	8	318	12.0	45.4	219	7.7	30.9	537	9.7	37.9
	9	375	14.1	59.5	350	12.2	43.1	725	13.2	51.1
	10	437	16.5	76.0	726	25.4	68.5	1163	21.1	72.2
	11	326	12.3	88.3	85	3.0	71.5	411	7.5	79.7
	12	311	11.7	100.0	408	14.3	85.8	719	13.0	92.7
	13	---	----	-----	404	14.1	99.9	404	7.3	100.0
	TOTALS	2652	100.0		2859	99.9		5511	100.0	

are just about evenly divided between cryptocrystalline silicates and quartzites. There are some interesting differences in the relative frequencies of material types and size categories between this subsurface debitage assemblage and the artifacts collected from the surface (see Table 9). Medium-size flakes were most abundant on the surface, and small flakes were fewest in number. Artifacts made from chert or chalcedonies were more numerous than those made of quartzite. These differences are mostly a reflection, I believe, of recovery techniques: small flakes are less visible on the surface, and the screen will catch more of them from the subsurface context than can be picked up from the surface. Similarly, given their more lustrous appearance, artifacts made of CCS are more likely to be noticed and picked up, while the screen favors no material type.

As observed with the surface sample, there appears to be a relationship between the material type and size of the artifacts. Starting with a null hypothesis (H_0) that there is no relationship between size and material type, a chi-square value of 67.97 is computed for the quantities in Table 23, which with 4 degrees of freedom, exceeds the expected value of 18.47 at the 0.001 level of significance (Thomas 1976:Table A.5). Thus, we can reject H_0 and accept the alternative hypothesis (H_1) that size and material type are related: smaller flakes are more likely to be chert or chalcedony, while larger flakes are quartzite. These results reinforce the conclusions derived from the surface debitage assemblage: quartzite materials may have been used for core tools, while the cryptocrystalline silicates are more likely to have been used as flake tools.

Table 23 Material Types and Sizes of All Debitage Collected from Test Units 95N, 99E and 95N, 100E

Size Categories[a]	Material Types CCS[b]	Quartzite	Other[c]	TOTALS (%)
small (< 2.0 mm)	1971	1689	100	3760 (68)
medium (2.0-4.0 mm)	618	786	47	1451 (26)
large (> 4.0 mm)	99	177	24	300 (5)
TOTALS (%)	2688 (49)	2652 (48)	171 (3)	5511

[a]numeric values shown are the diameters of circles within which the artifact fits

[b]cryptocrystalline silicates: includes chert and chalcedony

[c]includes unknown sedimentary and igneous rock types

As far as the vertical distribution of debitage is concerned, there is a definite trend in both units for a decline in the relative frequencies of CCS materials; similarly, quartzite materials increase in frequency. Apparently, for some unknown reason, earlier occupations favored quartzite materials, or, at least, had easier access to these materials. If the quartzites were more locally abundant, the subsistence round of the earlier occupants may have been more circumscribed than that of later inhabitants. The latter may have ranged further afield and had greater access to more "exotic" materials.

The frequencies of the different size categories vary a lot above Level 5; below that depth, they fluctuate very little. Levels 1-5 are the vandal's backdirt pile, and the artifacts found in these deposits were probably screened and discarded by the vandals. The artifact frequencies should be more variable, and mixed, in these disturbed deposits, as is the case.

Expedient Tools

Only 10 artifacts were recovered which have wear patterns indicating that they were used as tools of expediency. Table 24 summarizes the dimensions and morphological characteristics of these expedient tools. Tools made of quartzite predominate in this sample; however, two of the three hammerstones are made of chert. The average measurements of these artifacts do not differ greatly from those found on the surface of the site (see Table 10): the subsurface samples are slightly smaller, a little thicker, and heavier. Their weights are slightly inflated by two relatively larger specimens: a utilized flake (Cat. No. 253) and one hammerstone (Cat. No. 203). These tools are more likely to have been used on the distal end, on one margin, and on both faces. All three hammerstones were used on both ends. Sixty percent of the tools came from the lower levels of the test units, particularly Levels 10 and 12.

Ground Stone

Twenty-six fragments of groundstone were recovered from test unit excavations (Table 25). Fifteen of these fragments are

Table 24 Morphological Characteristics of Expedient Tools Collected from Test Units 95N, 99E and 95N, 100E

Cat. No.	F.S. No.	Provenience	Level	Linear Measurements (mm): Length	Width	Thickness	Weight (g)	Material	Description of Use Wear: Location: distal end	proximal end	one margin	two margins	Faciality: one face	two faces	Type
99	88	95N, 100E	2	69.9	58.3	12.5	41.7	chert				X	X		utilized flake
117	106	95N, 100E	5	65.3	65.3	17.9	77.8	quartzite			X				utilized flake
153	140	95N, 99E	6	63.2	56.6	26.3	80.3	quartzite	X		X			X	utilized flake
175	170	95N, 99E	7	47.2	34.2	20.9	48.5	chert	X	X					hammerstone
203	196	95N, 99E	10	(75.5)[a]	56.3	33.8	135.4	quartzite	X	X					hammerstone
205	196	95N, 99E	10	50.3	40.3	9.0	15.9	quartzite			X			X	utilized flake
235	209	95N, 100E	12	63.1	77.3	17.4	83.1	quartzite	X		X			X	utilized flake
236	209	95N, 100E	12	67.9	34.1	22.0	65.8	chert	X	X					hammerstone
253	220	95N, 100E	12	77.3	79.1	25.8	142.6	quartzite	X				X		utilized flake
269	233	95N, 100E	13	32.0	72.0	35.0	90.1	quartzite	X				X		utilized flake
			Means =	61.2	57.4	22.1	78.1	TOTALS =	7	3	4	1	2	3	
			Std. Dev. =	14.0	16.7	8.4	39.2								

[a]( ), incomplete dimension

Table 25 Morphological Characteristics of Groundstone Collected from Test Units 95N, 99E and 95N, 100E

				Linear Measurements (mm)					
Cat. No.	F.S. No.	Provenience	Level	Length	Width	Thickness	Material	Facial Use	Type
76	65	95N, 99E	surface	---	---	---	sandstone	unifacial	metate
89	78	95N, 100E	surface	---	---	---	sandstone	unifacial	metate
90	79	95N, 100E	surface	---	---	---	sandstone	unifacial	metate
95	84	95N, 100E	2	---	---	---	sandstone	unifacial	metate
128	117	95N, 100E	6	---	---	---	igneous	unifacial	mano
183	166	95N, 99E	7	---	---	---	sandstone	bifacial	mano
187	188	95N, 100E	10	---	---	---	sandstone	unifacial	metate
188	189	95N, 100E	10	---	---	---	sandstone	unifacial	metate
196	154	95N, 99E	7	---	---	---	sandstone	bifacial	mano
199	184	95N, 99E	8	---	---	---	igneous	bifacial	mano
216	172	95N, 99E	7	---	---	---	sandstone	bifacial	mano
217	173	95N, 99E	7	---	---	---	igneous	unifacial	mano
220	161	95N, 99E	6	---	---	---	sandstone	unifacial	metate
222	165	95N, 100E	9	---	---	---	sandstone	unifacial	metate
229	186	95N, 99E	9	---	---	---	sandstone	unifacial	mano
244	214	95N, 99E	11	100	65	55	sandstone	unifacial	mano
247	216	95N, 100E	11	105	107	45	sandstone	bifacial	mano
251	219	95N, 99E	11	---	---	---	sandstone	unifacial	mano
254	221	95N, 100E	12	---	---	---	sandstone	unifacial	metate
258	225	95N, 99E	12	---	---	---	sandstone	unifacial	mano
259	226	95N, 99E	11	(60)	85	45	igneous	unifacial	mano
260	227	95N, 100E	12	---	---	---	sandstone	unifacial	metate
266	231	95N, 99E	12	90	(65)	35	sandstone	unifacial	mano
267	232	95N, 99E	12	---	---	---	sandstone	bifacial	mano
277	239	95N, 100E	13	---	---	---	sandstone	unifacial	mano
305	230	95N, 99E	12	---	---	---	quartzite	unifacial	metate

[a]for dimensions: ---, measurement not taken; ( ), incomplete dimension

identified as manos; 11 are metates. Nearly all of the fragments are small, so it is difficult to determine how many whole artifacts they represent; the metates are particularly fragmentary. About 80 percent of the artifacts are made from a quartzitic sandstone, probably obtained from nearby exposures of Dakota sandstone. The remaining specimens are made of either an igneous material, probably basalt, or quartzite. All of the metates, and 40 percent of the manos, have been used on just one face; six specimens, all manos, show bifacial wear. The small size of these artifacts renders most measurements meaningless; nevertheless, the few which were measured, all manos, seem to be slightly smaller than those recovered from the surface (see Table 11). Half of the groundstone was recovered from Levels 10-13. As noted for the surface groundstone, some of the metates may have been used for cooking; the heat would have fractured the stone (Horn et al. 1987:112).

Rock Art

Two unusual items were found in the test units: rock fragments which have been incised on one face with several converging and intersecting lines. One of these items (Cat. No. 279) was found <u>in situ</u> in Test Unit 95N, 99E at a depth of 115 cm below the present ground surface; its depth below the original ground surface (at the base of the vandal's backdirt pile) would have been about 70 cm (Figure 33). This item was examined by Sally Cole (see Appendix A) and she affirms that it is typologically similar to the prehistoric petroglyphs found elsewhere at

Figure 33. Rock slab with rock art (Cat. No. 279) found in Test Unit 95N, 99E. White and black bars are 10 cm in length.

the site. She also believes that it is part of a larger boulder or rock slab, the remainder of which is still buried.

Finding this rock art fragment was fortuitous, since it was located in a stratigraphic context which permits an approximation of the age of some of the rock art at the site. A radiocarbon sample (Cat. No. 291), with an estimated age of 2730$\pm$200 years BP, was collected from Test Unit 95N, 99E at a depth of 40 cm below the original ground surface. Thus, the age of the rock art style represented on the buried rock slab -- and, by extension, stylistically similar elements on the back wall of the shelter-- exceeds this age estimate, which has a calibrated age range of 3159-2612 BC (1210-663 BP). According to Cole, these dates are consistent with the earliest dates of the Abstract Tradition of the Uncompahgre Complex, and suggest that this style may be even older than previously thought.

The second artifact (Cat. No. 299) is a smaller rock fragment, whose surface is incised, smoothed, and pecked. It is similar to Cat. No. 279, and may very well be part of the same buried rock art panel. This supposition cannot be verified, however, since this fragment was belatedly found in a pile of rocks which had been removed from the two test units.

Ecofacts

Two classes of ecofactual materials were recovered from the two test units: faunal materials and macrobotanical remains.

Faunal Materials

A total of 250 pieces of animal bone was recovered from Test Units 95N, 99E and 95N, 100 E. These specimens were identified and interpreted by Ronald J. Rood (Appendix F); his findings are summarized below.

Of the total sample, only 18 bones, less than 7 percent, could be identified to genus level. The remainder were identified to general categories of large mammal, medium mammal, general mammal, or unidentifiable. All of the bones that were identified to the generic level had intact articular surfaces, allowing the element and side to be identified. Rood identified three genera in the sample: jackrabbits (Lepus sp.), cottontail rabbit (Sylvilagus sp.), and ground squirrel (Spermophilus sp.), of which the cottontail rabbits are most numerous (see Appendix F, Table F1). The minimum number of individuals (MNI) determined for each genus is three cottontail rabbits, one jackrabbit, and one ground squirrel. Use of the cottontails, at least, as food by the site occupants is demonstrated by the presence of one burned scapula from this animal. The other animals were also probably eaten by the site occupants, but the absence of burning or other evidence of human use precludes verification of this possibility. This sample of identified species is too small to derive any conclusions about past environmental conditions.

Much of the unidentifiable bone is splintered and burned. Rood believes that marrow was extracted from these bones, and that bone grease was produced. Most of this unidentifiable bone is mammal, but only a small percentage of it could be identified as either medium-sized (14 percent) or large-sized (11.7 percent) mammal.

Table 26 summarizes the number of faunal specimens collected from each level in the two test units. Approximately 70 percent of the specimens come from the lower levels of the test units: Level 12, in particular, contains nearly one-quarter of the recovered bones. Most (over 60 percent) of the identified bone also came from these lower levels. These results suggest that early occupants of the site consumed sizable quantities of local animals, and extracted marrow and grease from their bones. Only three genera (two lagomorphs and a rodent) were positively identified, but many other mammals, including large and medium-sized species are represented in the sample. Use of the site as a faunal processing locality was particularly frequent prior to about 2700 years ago.

Macrobotanical Remains

A small piece of wood was collected from Level 8 in Test Unit 95N, 99E. It was examined and identified by Meredith Matthews (Appendix D). This specimen was identified as *Juniperus* sp. (juniper), a common taxa in the present vegetation community. Matthews believes that the juniper wood was used for fuel, although its use as construction materials cannot be excluded. The recovery of this wood specimen from Level 8, from which a radiocarbon date of 2730±200 BP was obtained, suggests that the composition of the vegetation community surrounding the site at this time may not have been much different from the present.

Test Unit 92N, 106E

The primary purpose of this test unit was to expose a continuous sequence of natural and cultural strata so that site

Table 26 Vertical Distribution of Faunal Materials Collected from Test Units 95N, 99E and 95N, 100E

	Level	Faunal Category[a]							TOTALS (%)
		Sylvilagus	Lepus	Spermophilus	Mammal	Medium Mammal	Large Mammal	Unid.	
Vandal's Backdirt	1								0
	2	3	1	1	2	1	1		9 (3.6)
	3	1			4 /1/				5 (2.0)
	4	1			15 /5/	1			17 (6.8)
Midden	5					3 /2/			3 (1.2)
	6				12 /8/	1			13 (5.2)
	7				8 /3/	1	7 /3/		16 (6.4)
	8				6 /6/		4 /3/		10 (4.0)
	9	1 /1/	2 /2/		21 /11/	2	3		29 (11.6)
	10	1	1		34 /15/	5 /4/			41 (16.4)
	11	1			18 /7/	8 /8/	6	8 /4/	41 (16.4)
	12	2	1		42 /3/	4 /2/	10		59 (23.6)
	13	2			3	2 /2/			7 (2.8)
TOTALS (%)		12 /1/ (4.8)	5 /2/ (2.0)	1 (0.4)	165 /59/ (66.0)	28 /18/ (11.2)	31 /6/ (12.4)	8 /4/ (3.2)	250 (100.0)

[a] / /, number of burned bones

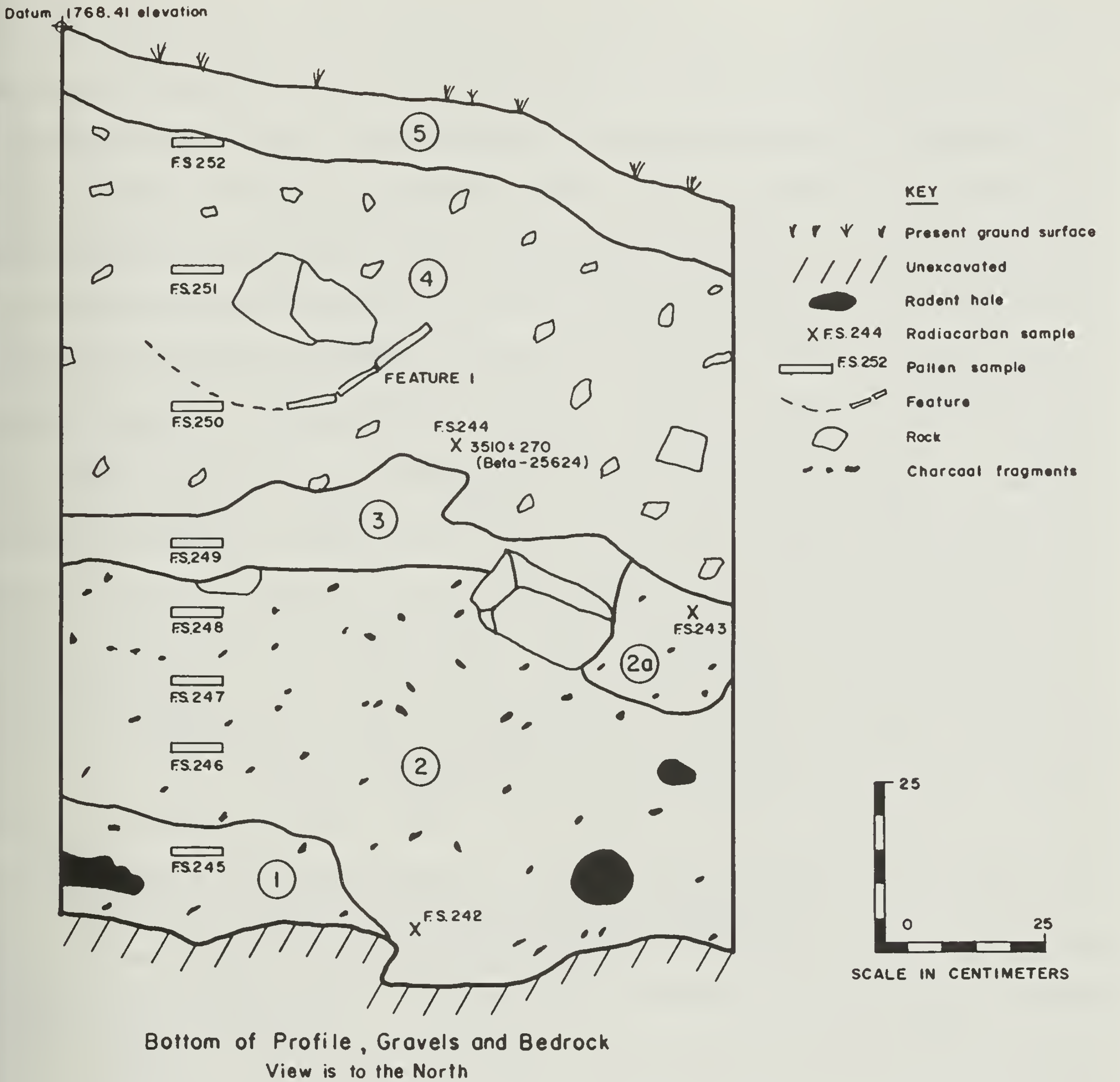
formation processes could be characterized. The unit was placed where the maximum amount of stratigraphic information could be obtained, but since the stream channel cuts diagonally across the orientation of the excavation grid pattern (see Figure 9), it is only half the size of the other two units.

Stratigraphy and Chronology

Test Unit 92N, 106E was excavated to bedrock at a depth of 140 cm below datum. The last 40 cm of the unit were excavated as one level due to time limitations and our desire to reach sterile bedrock. The absolute elevation of the unit datum in the northwest corner was 1768.41 meters above sea level. A profile sketch of the excavated north wall of the unit (Figure 34) reveals the existence of six layers; these layers are described further in Table 27.

Table 27 Layers Identified in Test Unit 92N, 106E

Layer	Color (Munsell)	Description
1	light yellowish brown (10 YR 6/4)	Moderately compacted sand with a few bits of charcoal
2	brownish yellow (10 YR 6/6)	Moderately compacted gravelly sand with calcium carbonate and much charcoal
2a	yellowish brown (10 YR 5/4)	Compacted sand with charcoal
3	light yellowish brown (10 YR 6/4)	Compacted sand with no charcoal
4	grayish brown (10 YR 5/2)	Cultural midden: moderately compacted sand with numerous angular rock fragments
5	grayish brown (10 YR 5/2)	Root zone, similar to Layer 4 but with few rocks



Layer 1	Moderately compacted sand with a few bits of charcoal, light yellowish brown, 10YR 6/4
Layer 2	Moderately compacted gravelly sand with $CaCO_3$ and much charcoal, brownish yellow, 10YR6/6
Layer 2a	Compacted sand with charcoal, yellowish brown, 10YR5/4
Layer 3	Compacted sand, no charcoal, light yellowish brown, 10YR6/4
Layer 4	Cultural midden; moderately compacted sand with numerous angular rock fragments, greyish brown, 10YR5/2
Layer 5	Root zone, similar to Layer 4 with fewer rocks

Figure 34. Profile sketch of the north wall of Test Unit 92N, 106E.

This profile matches closely one drawn and described by Nancy Lamm for the adjacent west wall (Appendix B). Given the abundance of charcoal, Layers 2, 2a, and 4 represent cultural midden. All three layers, but especially Layers 2 and 2a, have been disturbed by colluvial slope wash and reworked by moderate fluvial activity. In contrast, Layers 1 and 3 are natural deposits, representing low to moderate fluvial deposition with reworking by eolian deposition. Intercalated between Layers 2 and 4, the deposition of Layer 3 interrupted the cultural midden sequence and may represent an occupational hiatus at the site.

Two charcoal samples were collected from this unit for radiocarbon age determinations: one from the stratigraphic profile, and the second from Feature 2 during excavations in the unit. Table 28 summarizes the age determinations.

Table 28 Radiocarbon Age Determinations for Charcoal Samples Collected from Test Unit 92N, 106E

Lab No.	F.S. No.	Cat. No.	Depth[a]	Association	C-14 Age (Years BP)	Calibrated Age Range[b] (± 1 Std. Dev.)
Beta-26648	183	197	76	Feature 2, at top of Layer 2	3460±100	3868-3591 (1919-1642 BC)
Beta-25624	244	282	60	Stratigraphic profile, at base of Layer 4	3510±270	4219-3469 (2270-1520 BC)

[a]in centimeters below unit datum

[b]Stuiver and Becker (1986)

As the calibrated age ranges demonstrate, these two samples appear to be nearly contemporaneous. This null hypothesis of contemporaneity can be tested statistically with the Student's-t distribution (Thomas 1976:249-250). A t value of -0.174 is calculated, which with infinite degrees of freedom is less than the appropriate value of $t_{0.05} = 1.96$ and allows us to conclude that the difference between the two dates is not significant. Since sample Beta-26648 lies at the top of Layer 2, and sample Beta-25624 at the base of Layer 4, with Layer 3 interposed between these two midden deposits, it can be deduced that the occupation represented by Layer 2 was interrupted about 3500 years ago by storm activity of limited duration which laid down a relatively thin layer of sand. Reoccupation of the site, as represented by Layer 4, occurred not long after this interruption. These two dates are appropriately older than the stratigraphically superior radiocarbon age determination of 2730±200 BP from Test Unit 95N, 99E (see Table 15). These occupations represented by the radiocarbon dates from 92N, 106E occurred at the beginning of the Late Period of the Archaic of the Uncompahgre Technocomplex (Horn, et al. 1987).

Features

Two cultural features were discovered during the excavations in Test Unit 92N, 106E. The characteristics of each are described below.

Feature 1 was first recognized in the northwest corner of the unit at a depth of about 60 cm below datum as two charcoal-rich layers, separated by a thin fire-hardened lens. The bottom layer consists of a dark brown (7 YR 4/2), sandy silt with charcoal. It is about 7 cm thick and rests on a layer of light brown (7 YR 4/2), loose sandy silt which has no charcoal. Above this is a thin (1 cm thick) lens of fire-hardened, light brown (7 YR 6/4) sandy silt which lacks charcoal. The top layer is a 3 or 4-cm-thick layer of dark brown (7 YR 4/2) sandy silt with abundant charcoal. The fire-hardened lens is visible in the stratigraphic profile (Figure 34) as a shallow arc, measuring about 45 cm wide and 13 cm deep.

Feature 1 is interpreted to be a shallow hearth, within which at least two fires were built. The bottom charcoal-rich layer represents Fire Episode 1. At a somewhat later point in time, another fire, Fire Episode 2, was built above the remains of the first. The second fire was hot enough to weld the top of the earlier fire into a hard, thin layer.

Two charcoal samples, one from each fired layer, were recovered from Feature 1 and submitted for radiocarbon age determination. Unfortunately, both samples contained insufficient amounts of carbon to permit a reliable age determination. A macrobotanical sample was collected from the interior of Fire Episode 1 and submitted to Meredith Matthews for analysis. The results of her analysis are described fully in Appendix D and below, but it can be noted here that the feature contained juniper and dicot wood and three charred goosefoot (Chenopodium sp.) seeds. In other words, wood from local trees was used as fuel, and plants were either cooked in the fire or processed nearby.

Feature 2 is an area of charcoal-rich soil with an irregular outline, found at a depth of approximately 75 cm below datum. The soil is a dark gray (10 YR 4/1), moderately compacted sand, containing numerous large pieces of charcoal. Several of these charcoal pieces were collected (F.S. 183) and yielded the radiocarbon age determination of 3460±100, described above. A wood specimen was also collected, and was analyzed by Ms. Matthews. She determined that it was a piece of juniper (Appendix D). Some flakes and a few pieces of bone were found within the feature.

The purpose of this feature is not easy to fathom. It may simply represent a place where the contents of fire pits from other areas of the site were discarded. It could also be the location of a temporary structure which had burned. Verification of either of these possibilities cannot be made with the present data.

Artifacts

Excavations in Test Unit 92N, 106E recovered a total of 758 artifacts. Table 29 summarizes the types and numbers of artifacts for each level. Only two prepared tools were recovered, a fine-percussion blank and a scraper; the remaining artifacts are all debitage. Even if the number was doubled to compensate for the reduced excavation area, considerably fewer artifacts were recovered from this unit than from the other two units. We may conclude from these results that this area of the site did not experience as intensive aboriginal activity as the rest of the site; in fact, it is possible that many of the artifacts recovered from Test Unit 92N, 106E are secondary refuse, washed downslope

Table 29 Summary of Artifacts Collected from Test Unit 92N, 106E

Artifact Type				Excavation Levels												
				0	1	2	3	4	5	6	7	8	9	10	11-15	TOTALS
CHIPPED STONE	Prepared Tools	Bifacial Tools	Roughout	0	0	0	0	0	0	0	0	0	0	0	0	0
			R.P. Blank	0	0	0	0	0	0	0	0	0	0	0	0	0
			F.P. Blank	0	0	0	0	0	0	1	0	0	0	0	0	1
			Preform	0	0	0	0	0	0	0	0	0	0	0	0	0
			Proj. Point	0	0	0	0	0	0	0	0	0	0	0	0	0
			Knife	0	0	0	0	0	0	0	0	0	0	0	0	0
		Unifacial Tools	Scraper	0	0	0	0	0	0	0	0	0	0	0	1	1
			Scraper Plane	0	0	0	0	0	0	0	0	0	0	0	0	0
	By-Products of Tool Manufacture		Core	0	0	0	0	0	0	0	0	0	0	0	0	0
			Debitage	10	5	18	36	92	85	115	107	82	92	105	9	756
	Expedient Tools		Hammerstone	0	0	0	0	0	0	0	0	0	0	0	0	0
			Chopper	0	0	0	0	0	0	0	0	0	0	0	0	0
			Util. Flake	0	0	0	0	0	0	0	0	0	0	0	0	0
GROUND STONE			Metate	0	0	0	0	0	0	0	0	0	0	0	0	0
			Mano	0	0	0	0	0	0	0	0	0	0	0	0	0
			TOTALS	10	5	18	36	92	85	116	107	82	92	105	10	758
			(%)	(1.3)	(0.7)	(2.4)	(4.7)	(12.1)	(11.2)	(15.3)	(14.1)	(10.8)	(12.1)	(13.9)	(1.3)	(99.9)

from the main activity area under the overhang. This conclusion can be tested using the debitage (see below).

The bifacial tool is the basal fragment of a fine percussion blank. It was recovered from Level 6. Its original length is estimated to have been about 75 mm, it is 38.2 mm wide and 7.7 mm thick, and its thickness/width ratio is 0.202; its weight is estimated to be about 29 grams. This specimen, made of brown chert, is slightly larger than the average fine percussion blank recovered from Test Units 95N, 99E and 95N, 100E (see Table 18).

The scraper was recovered from the bottom, 40-cm-thick level of the deposits in the unit. It is made of chalcedony and measures 37 mm long, 35 mm wide, and 12.2 mm thick; it weighs 18.3 grams. One end of the artifact shows, as evidence of use, a minor amount of step fracturing. The size of this artifact falls well within the average measurements of the unifacial tools recovered from the other test units (see Table 20).

Nearly the entire artifactual assemblage from Test Unit 92N, 106E consists of debitage. As shown in Table 29, the frequencies of debitage in each level are low through Level 3, increase markedly in Level 4, remain relatively stable through Level 10, and decline dramatically in the combined Levels 11 to 15.

I mentioned above that the accumulation of artifacts in this unit may be due more to natural processes such as slope wash than to human activity, as is probably the case in Test Units 95N, 99E and 95N, 100E. This possibility can be stated as a null hypothesis (H_0): There are no significant differences between Test Units 95N, 99E/95N, 100E and Test Unit 92N, 106E in the frequencies of debitage in the excavation levels; the alternate hypothesis (H_1) is that there are significant differences. Table 30 compares the frequencies and cumulative proportions of debitage by stratigraphic level for the three test units. Since we are comparing two samples, measured in ordinal categories and arranged as cumulative proportions, a non-directional (two-tailed) Kolmogorov-Smirnov Two-Sample Test is appropriate (Thomas 1976:322-326). Strictly speaking, H_o holds that the maximum difference (D_{max}) between the two distributions should equal zero, while H_1 says that D_{max} will be significantly greater than zero. As shown in Table 30, D_{max} for this example equals -0.256. The critical value of D_{max} with a significance level of 0.01 for a two-tailed test is computed as:

$$D = 1.63 \sqrt{\frac{3977 + 747}{(3977)(747)}} = 0.065$$

The derived value of D_{max} = -0.256 exceeds the critical value of D_{max} = 0.065, which suggests that H_o can be rejected in favor of H_1: there is a statistically significant difference between the two groups of test units in the cumulative proportions of debitage in the stratigraphic levels.

Table 30 Frequencies of Debitage by Excavation Level in Test Units 95N, 99E/95N, 100E and 92N, 106E

Excavation Level (in inches below datum)	Debitage						Difference	
	95N, 99E/95N, 100E			92N, 106E				
	f	Cum. f	Cum. %	f	Cum. f	Cum. %		
0-10	62	62	0.016	15	15	0.020	-0.004	
10-20	154	216	0.054	18	33	0.044	0.010	
20-30	91	307	0.077	36	69	0.092	-0.015	
30-40	56	363	0.091	92	161	0.216	-0.125	
40-50	156	519	0.131	85	246	0.329	-0.198	
50-60	384	903	0.227	115	361	0.483	-0.256	D_{max}
60-70	649	1152	0.390	107	468	0.627	-0.237	
70-80	537	2089	0.525	82	550	0.736	-0.211	
80-90	725	2814	0.708	92	642	0.859	-0.151	
90-100	1163	3977	1.0	105	747	1.0	0.0	
	n = 3977			n = 747				

In the strictest sense, this exercise has simply demonstrated that the vertical distributions of debitage in Test Unit 92N, 106E differ significantly from Test Units 95N, 99E and 95N, 100E. We have assumed that the reason for this difference is due to the agent of deposition, human vs. natural. The differences might also be explained by differential rates of deposition or areally specific activity patterns. These possibilities represent fruitful areas of research for future investigations.

Ecofacts

Three classes of ecofactual materials were recovered from this test unit: faunal materials, macrobotanical remains, and pollen. Each class is described below.

Faunal Materials

Only 15 pieces of animal bone were recovered from Test Unit

92N, 106E. These specimens were identified and interpreted by Ronald J. Rood (Appendix F); his findings are described below.

Only one bone could be identified to genus level: the humerus of a jackrabbit (Lepus sp.). The remaining specimens were identified as either a medium-sized mammal (9 pieces) or an unidentified mammal (5 pieces). Over half of the general mammal bone is burned, suggesting that these animals had been eaten by the site occupants.

Table 31 summarizes the number of faunal specimens collected from each level in this test unit. As can be seen, all of it was recovered from the middle strata, particularly Levels 6 and 7. This is approximately the same depths from which the radiocarbon samples were obtained, thus putting an age of about 3500 years ago for this faunal processing activity.

Macrobotanical Remains

A flotation sample and a charred piece of wood were collected from Test Unit 92N, 106E. Both samples were processed and analyzed by Meredith Matthews (Appendix D). The flotation sample (F.S. 171) was collected from Fire Episode 1 in Feature 1, at a depth of approximately 65 cm below the unit datum. According to Matthews, it contained three Chenopodium sp. (goosefoot) seeds, and pieces of Juniperus sp. (juniper) and an indeterminate genus of Dicotyledoneae (dicot); all of these remains were charred. The juniper and dicot wood are believed to have been used for fuel. The presence of the three charred goosefoot seeds is not necessarily indicative of economic use by the aboriginal inhabitants: they may have grown nearby in disturbed deposits and were acciden-

Table 31 Vertical Distribution of Faunal Materials Collected from Test Unit 92N, 106E

Level	Faunal Category[a]							TOTALS (%)
	Sylvilagus	Lepus	Spermophilus	Mammal	Medium Mammal	Large Mammal	Unid.	
1								0
2								0
3								0
4								0
5		1						1 (6.7)
6					6			6 (40.0)
7				3 /3/	3 /3/			6 (40.0)
8				2 /2/				2 (13.3)
9								0
10								0
11-15								0
TOTALS (%)	0	1 (6.7)	0	5 /5/ (33.3)	9 /3/ (60.0)	0	0	15 (100.00)

[a] / /, number of burned specimens

tally included into the cultural context. Nevertheless, since they were recovered from a cultural feature, the possibility is good that this plant was procured and processed by the site occupants.

The charred wood specimen was collected from Feature 2 at a depth of 73 cm below unit datum. Matthews identified this sample as juniper wood, and proposes that it, too, was used as fuel.

Pollen

A suite of eight pollen samples were collected in a vertical column from the north wall of Test Unit 92N, 106E (Figure 34). These samples, along with a control sample taken from the site surface, were processed and analyzed by Linda Scott Cummings (Appendix E). The eight samples were collected from different strata in an effort to derive some conclusions about paleoenvironmental conditions of the area surrounding the site and, if possible, to identify subsistence activities at the site.

The surface pollen record is dominated by shadscale and saltbush (Cheno-ams), with smaller amounts of Gamble oak, sagebrush, serviceberry and mountain mahogany, snakeweed and rabbitbrush, and ragweed. The frequency of pine pollen is the least amount found in the record; conversely, the largest quantity of juniper pollen was observed in the surface sample. This is the only time that the frequency of juniper pollen was greater than pine in the record.

From the pollen column, the following observations can be made. In Layer 1, the lowermost stratum, pine pollen is at its highest frequency. The frequency of Cheno-am is low and sagebrush is only slightly higher. Cummings believes that these relationships indicate a cooler and/or more mesic climate. The three samples collected from Layer 2 display higher frequencies of Cheno-am, but slightly less sagebrush, and relatively very little pine. Rabbitbrush and/or snakeweed pollen increases throughout the stratum, suggesting that these plant populations were expanding. A warmer and/or drier climate is indicated by these data. In Layer 3, the frequencies of pine pollen increase and juniper decreases, indicating a shift to a pine-dominated pinyon-juniper woodland. A decline in Cheno-ams is noted, but the greatest frequency of rabbitbrush and/or snakeweed occurs in this layer. These results signify the persistence of a warm and/or dry climate. Finally, the pollen record in Layer 4 begins with a peak in pine pollen which diminishes in the upper levels; conversely, the frequency of the Cheno-ams and rabbitbrush and/or snakeweed is very low. A cooler and possibly more mesic climate is indicated by these data. A radiocarbon age estimate of 3510±270 BP is closely associated with the pollen sample from the bottom of Layer 4, providing an approximate date for this cooler, more mesic interval. After this, pine pollen abruptly declines and Cheno-ams abruptly increase, accompanied by first an increase and then a decline in the rabbitbrush and/or snakeweed pollen. These results suggest a diminishment of the pinyon-juniper woodland and the onset of a warmer, drier climate, very similar to the present environment.

Evidence of subsistence activity is scant in the pollen record. The quantities of Cheno-ams in Layers 2 and 4 connote the possibility that the greens and seeds of these plants were gathered, processed, and discarded by the site occupants. The macrobotanical remains described by Matthews (Appendix D) appear to bear out this possibility. Prickly pear cactus is unexpectedly frequent in Layers 2 and 4, suggesting that the pads and/or fruit may have been collected and eaten.

Cummings notes several similarities between the Harris Site pollen record and those collected form other sites in western Colorado. The cooler and/or more mesic interval associated with the 3500 BP date (calibrated age range of 2270-1520 BC) is preceded by a long period which began cooler and gradually warmed. It is followed by a similarly long drier climatic period, much like the modern environment. More data are needed to clarify further these climatic interpretations, and the Harris Site is a potentially good source for such data.

Summary of Results

The vandals who despoiled the Harris Site have unwittingly helped further our understanding of the regional prehistory and history. By excavating a large pit in the rockshelter, they exposed the site's internal deposits, showing them to be relatively deep and finely stratified. Furthermore, their activities goaded us into conducting more extensive research at the site before it was destroyed. During this initial phase of research, the site and its rock art were formally recorded, the surface topography and the distribution of artifacts on that surface were mapped, and three test units were excavated. A substantial amount of important data was gathered by these efforts.

Chipped stone and ground stone artifacts are lightly scattered over the surface of the site, on both sides of a small, intermittent drainage. Quite a few of these artifacts are found next to the vandal's pit, suggesting that they had been removed by the vandals and discarded. Debitage dominates the chipped stone assemblage, but bifacial tools, unifacial tools, cores, utilized flakes, and a chopper were also found. More roughouts were found among the bifacial tools, but fine-percussion blanks and preforms are also common. Most of the prepared tools and cores are made of quartzite, while the expedient tools and debitage are fashioned from cryptocrystalline silicates (CCS). Close inspection of the debitage determined that there is a significant relationship between flake size and material, i.e. the larger flakes are more likely to be made of quartzite, while the smaller flakes are chert or chalcedony. I concluded from this relationship that quartzite was favored by the prehistoric inhabitants for core tools, and CCS for flake tools.

Four projectile points were collected from the site surface. Two are identified as Elko Corner-notched, a temporal and morphological type which persists throughout the Archaic and Late Prehistoric Stages. The other two points are small corner-notched varieties. One resembles a Rose Spring Corner-notched (A.D. 300 to 900-1000), and the other is similar to those assigned to the Coal Creek Phase (A.D. 700-1300) on the Uncompahgre Plateau.

Thirty pieces of ground stone were found on the site surface, most of them from the vandal's discard piles. Of this total, 17 are recognized as metates and the remainder as manos. It is uncertain, however, how many complete specimens are represented.

A small, but significant scatter of historic artifacts was found on the south side of the drainage. These include metal cans, a metal spoon, a rifle cartridge, a short length of chain, and 12 seed beads. The head stamp on the cartridge indicates that it was manufactured in April 1879, and probably deposited at the site between 1879 and 1881. The chain is part of a nineteenth century Spanish ring spade bit. The beads are types manufactured for the Indian trade between ca. 1840 and 1890 to 1910. These items were probably left behind by a small group of Utes who camped at the locality sometime between 1879 and 1881.

Two features were identified on the surface. One is an anomalous charcoal-stained area, while the other is a crude arrangement of stones of unknown function. The Coal Creek Phase projectile point mentioned above was found on top of one of the rocks in the arrangement.

Six rock art panels are found along the cliff face behind the site. They contain abstract and zoomorphic or anthropomorphic elements, pecked or incised in the rock by the prehistoric inhabitants, historic Utes, or historic Euroamericans. The incised lines were probably made with sharp flakes of stone. The prehistoric elements are clearly representative of the regionally ubiquitous Uncompahgre Style, dating between 1300 B.C. and A.D. 1300.

Three test units were excavated: two contiguous one meter square units near the vandal's pit, and a partial unit near the stream's edge. A total of 3.2 cubic meters of dirt were removed from these units.

Four strata were defined in the two contiguous units (95N, 99E and 95N, 100E): two are considered to be part of the vandal's backdirt piles, one is cultural midden, and the other is a gravel lens. A radiocarbon age estimate of 2730±200 BP was obtained from a piece of charcoal, collected from the midden at a depth about 40 cm below the original (pre-vandalism) surface.

A total of 5,613 artifacts was recovered in nearly equal proportions from the two test units. The overwhelming majority of these artifacts are flakes, and their frequencies noticeably increase below the vandal's backdirt. Like those on the surface, the larger flakes from a buried context tend to be made of quartzite, while the smaller flakes are CCS. This observation supports the idea promulgated for the surface artifacts that core tools were made of quartzite and flake tools from chert or chalcedony.

In addition to flakes, bifacial tools (mostly fine-percussion blanks), projectile points, unifaces, cores, utilized flakes, and hammerstones were recovered. The projectile points are stratigraphically distributed, with Late Prehistoric Rosegate Series and Coal Creek Phase varieties at the top, Archaic Elko corner-notched varieties in the middle, and Late Paleoindian types at the bottom.

Several small fragments of ground stone were recovered from these two units. It is not certain how many whole artifacts may originally have been left here, but 15 pieces of metates and 11 manos were found. Two fragments of stone were found which have incised lines on one surface. The method of manufacture and arrangement of elements is identical to those found on the rock art panels. Both pieces of stone are thought to have broken off of a larger, still-buried slab or boulder. One of the fragments was recovered from a stratigraphic context below the 2730±200 BP radiocarbon age estimate. If accurate, this age extends the time range of the Uncompahgre Style of rock art.

A relatively sizable amount of animal bone was recovered from the two units. Identified species include jackrabbit, cottontail rabbit, and ground squirrel. The remaining bone could be identified only to general categories of large, medium, and general mammal. Most of the bone is splintered and burned, indicating that marrow and bone grease were extracted.

A piece of juniper wood was collected from approximately the same stratigraphic level as the radiocarbon age estimate. This suggests that the vegetation community surrounding the site at this time may not have been much different from the present.

The third test unit (92N, 106E) was placed next to the drainage so as to expose a continuous stratigraphic sequence. Six strata were identified: two layers of cultural midden, separated by a thin layer of compact, stream-deposited sand, and underlain by moderately compacted sand which was deposited by low- to moderate-level fluvial activity. The intercalated layer may represent an occupational hiatus.

Two cultural features were identified. Feature 1 is a shallow firepit, containing two episodes of firing, found in the top cultural layer at about 60 cm below datum. Feature 2 is an area of charcoal-rich soil, found in the lower cultural layer; its edges are not clearly defined. Its function is uncertain, but an ash dump, or the location of a temporary structure which had burned, are possibilities. A radiocarbon age estimate of 3460±100 BP was obtained from a piece of charcoal collected from Feature 2. A second piece of charcoal, collected from near the base of the top cultural layer, returned a radiocarbon age estimate of 3510±270 BP. These two age estimates overlap, and they suggest that the occupational hiatus between the two cultural layers was of relatively short duration.

A total of 758 artifacts was collected from this test unit. Only two tools, a fine-percussion blank and a scraper, were found; the rest is debitage. The vertical distribution of debitage in 92N, 106E differs significantly from 95N, 99E and 95N, 100E. Several ideas could be advanced to explain this result, but the possibility that the cultural layers in this unit represent secondary refuse, washed downslope from the main activity area near the rock shelter, seems most plausible. The presence of Feature A and Feature 1 in this area suggests, however, that primary deposition may have occurred close to the stream channel.

A total of 15 pieces of bone was recovered from Test Unit 92N, 106E. One species, a jackrabbit was identified; the remaining bone came from either a medium-sized or unidentified mammal.

A flotation sample was collected from the interior of Feature 1. It contained three burned goosefoot seeds and charred pieces of juniper and dicot wood. In addition, a charred piece of juniper wood was obtained from Feature 2. The prehistoric inhabitants apparently harvested and processed local plants, and exploited nearby trees for fuel.

A suite of eight pollen samples was collected as a vertical column from the north face of the test unit; a ninth sample was taken from the present ground surface as a control. The pollen identified in these samples permitted interpretations of paleoclimatic conditions. Sometime prior to about 3500 BP, the climate fluctuated between cool/moist and warm/dry, as determined from the variations in the amounts of pine, juniper, and Cheno-ams. At the base of the upper cultural layer, with a date of 3500 BP, the incidence of pine pollen is high, and Cheno-ams and the high-spine Compositae are low, suggesting a cooler, more mesic climate. Then, the pine decreased and Cheno-ams increased as the climate gradually warmed to the present conditions. Presently, the surrounding vegetation community has a high proportion of Cheno-ams and a higher juniper to pine ratio. The paleoclimatic record interpreted form the Harris Site matches those obtained form other sites in western Colorado. The pollen record also reveals that the prehistoric inhabitants were exploiting goosefoot and prickly pear cactus for food.

VII

INTERPRETATIONS OF RESULTS

The previous section described, in exhaustive detail, the results of archaeological investigations at the Harris Site. This discussion included the surface remains and rock art, as well as the materials recovered from the test excavations. The task now at hand is to interpret these results within the known environmental and culture-historical contexts, details of which were presented in Chapters 2 and 3.

These interpretations are organized in such a way as to address the three problem domains identified in Chapter 4: refinement of local chronology, paleoenvironmental reconstruction, and reconstruction of prehistoric lifeways. The interpretations proposed here are considered tentative since only a small percentage of the buried deposits on the site were actually evaluated. However tentative they might be, they will serve effectively as points of departure for future investigations.

Stratigraphy and Chronology

Excavations in the three test units provided a glimpse at the natural and cultural deposits present on the site. This was particularly true in Test Unit 92N, 106E (hereafter Unit 3), located adjacent to the drainage, where a continuous stratigraphic sequence from bedrock to root zone was exposed. The stratigraphy in the contiguous units 95N, 99E (Unit 1) and 95N, 100E (Unit 2) was less complicated, inasmuch as nearly one-half of the excavated deposits consisted of the vandal's backdirt pile.

A composite stratigraphic profile has been assembled from the profiles of the individual test units (Figure 35). It has been constructed so as to display the position of each unit relative to the Primary Datum. As can be seen in the sketch, the tops of contiguous Units 1 and 2 are nearly level with the datum, whereas Unit 3 is located downslope from these units and about 160 cm below the Primary Datum.

Six stratigraphic levels, labelled I-VI from bottom to top, are delineated in the composite profile. The depths and composition of each level are described in Table 32.

Table 32 Descriptions of Composite Stratigraphic Levels at the Harris Site

Stratum	Approximate Depths (cm below PGS)	Occurrence	Nature of Deposit
I	115-130	All units	Light yellowish brown, moderately compacted sand with scattered bits of charcoal
II	80-115	All units	Brownish yellow, moderately compacted gravelly sand with $CaCO_3$ and some charcoal
III	70-80	All units	Light yellowish brown, compacted sand with no charcoal
IV	10-70	Unit 3	Cultural midden: grayish brown moderately compacted sand with angular rock fragments
	45-135	Units 1 & 2	
V	0-10	Unit 3	Root zone: grayish brown moderately compacted sand with few rock fragments
VI	0-45	Units 1 & 2	Vandal's backdirt

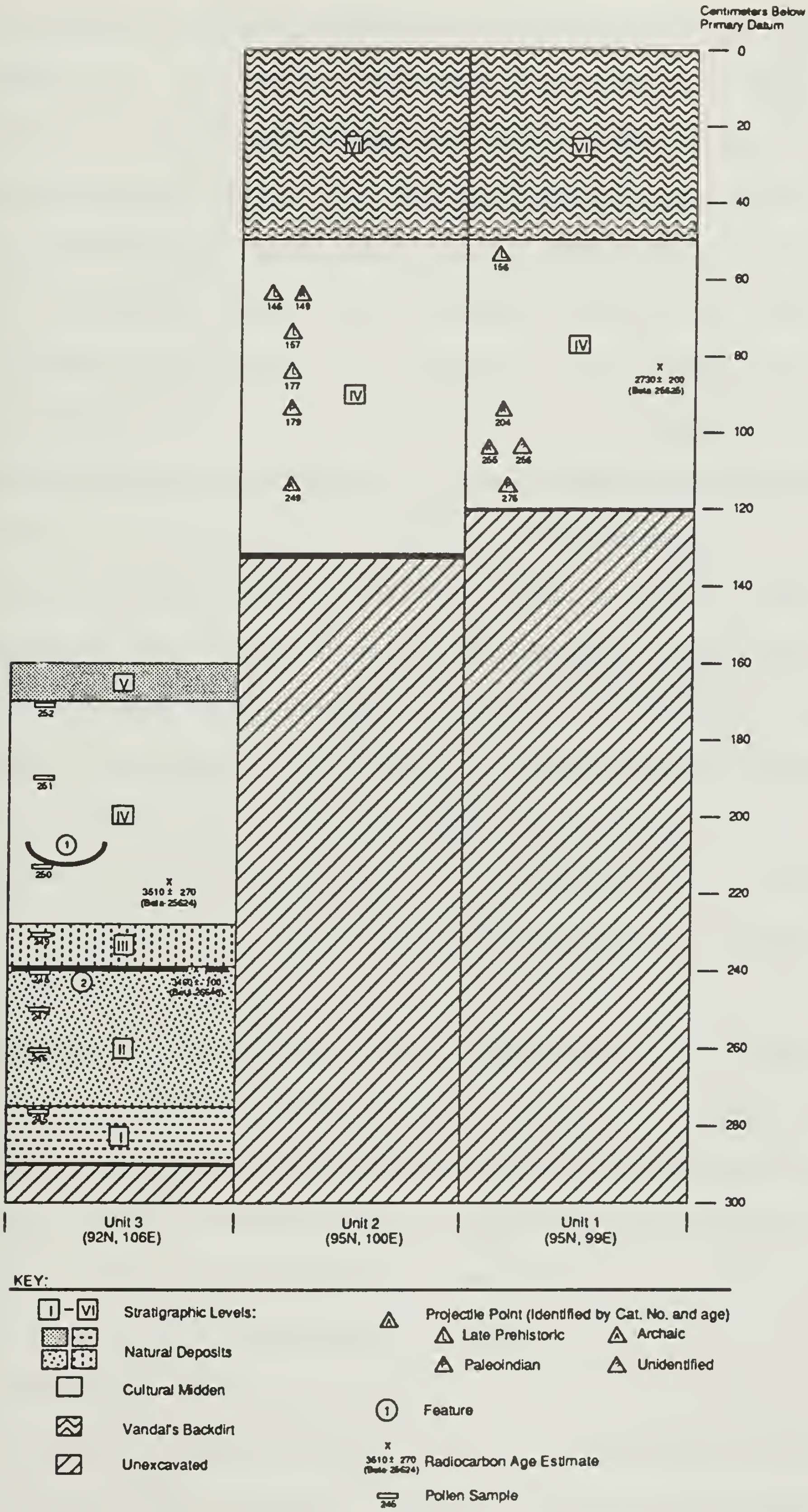


Figure 35. Composite stratigraphic profile of the Harris Site deposits.

These strata correspond closely to the soil units defined by Lamm (Appendix B) for the west wall profile of Unit 3. She concludes that her Soil Unit 4, which correlates to Stratum I, is either an eolian or low energy fluvial deposit, or midden deposit reworked by both forms of deposition. Her Soil Unit 3, matching Stratum II, is probably an eolian deposit with some mixing of midden deposits. Soil Unit 2, midden material, obviously corresponds to Stratum IV. Soil Units 5 and 6, which do not appear in the composite stratigraphic profile, are gravel stringers representing short episodes of moderate energy fluvial deposition.

Lamm concludes from her study of the sediments in the test unit profile that the deposits which underlie the cultural midden indicate a moister climate with increased vegetative cover. The nearby stream carried sands and gravels, which were deposited along the sides of the drainage channel, and probably in the rockshelter. During and after the site occupation, there was a shift to a drier climate, which resulted in a decrease in the vegetative cover, an increase in surface runoff, and entrenchment of the stream channel. In effect, then, this climatic shift might have resulted in a decrease in available plant resources and potable water for the aboriginal occupants, but it also provided a more secure habitation spot above the entrenched stream channel.

Two lines of evidence are used to date these deposits: chronometric (radiocarbon) age estimates and diagnostic artifacts (projectile points). Three radiocarbon age estimates were obtained during the excavations: two from Unit 3 and one from Unit 1 (see Figure 35 for locations). Sample Beta-26648, with a calibrated age range of 1919-1642 B.C., was collected from the top of Stratum II, and sample Beta-25624 with a calibrated age range of 2270-1520 B.C., came from the base of Stratum IV (Figure 36). It may seem that the two age estimates are stratigraphically reversed; however, given the large standard deviation of Beta-25624, its actual age may be appropriately younger than Beta-26648. These dates suggest the following scenario: the site (or, at least, this area of the site) was first occupied briefly about 3500 years ago; this occupation was interrupted by storm activity of limited duration which deposited Stratum III; and, finally, aboriginal peoples returned to the site not long after this storm episode and left behind a thick midden deposit. The third radiocarbon sample, Beta-25625, returned a calibrated age range of 1210-663 B.C. and is stratigraphically accurate (Figure 36). Its position in about the middle of Stratum IV suggests that aboriginal peoples returned to the site, possibly on a seasonal basis, for at least 700 years, and probably continued to live there until historic times.

The vertical distribution of temporally diagnostic projectile points further clarifies the site chronology. In Unit 1 especially, the points are neatly arranged from a late Paleoindian type at the bottom, through two Archaic types and an unidentified type in the middle, to a Late Prehistoric type at the top of the stratum. Given the chronometric ages and its vertical location, it is likely that the Paleoindian point was picked up and reused by Archaic peoples, rather than being any indication of a very early occupation. One of the Archaic type points was found just

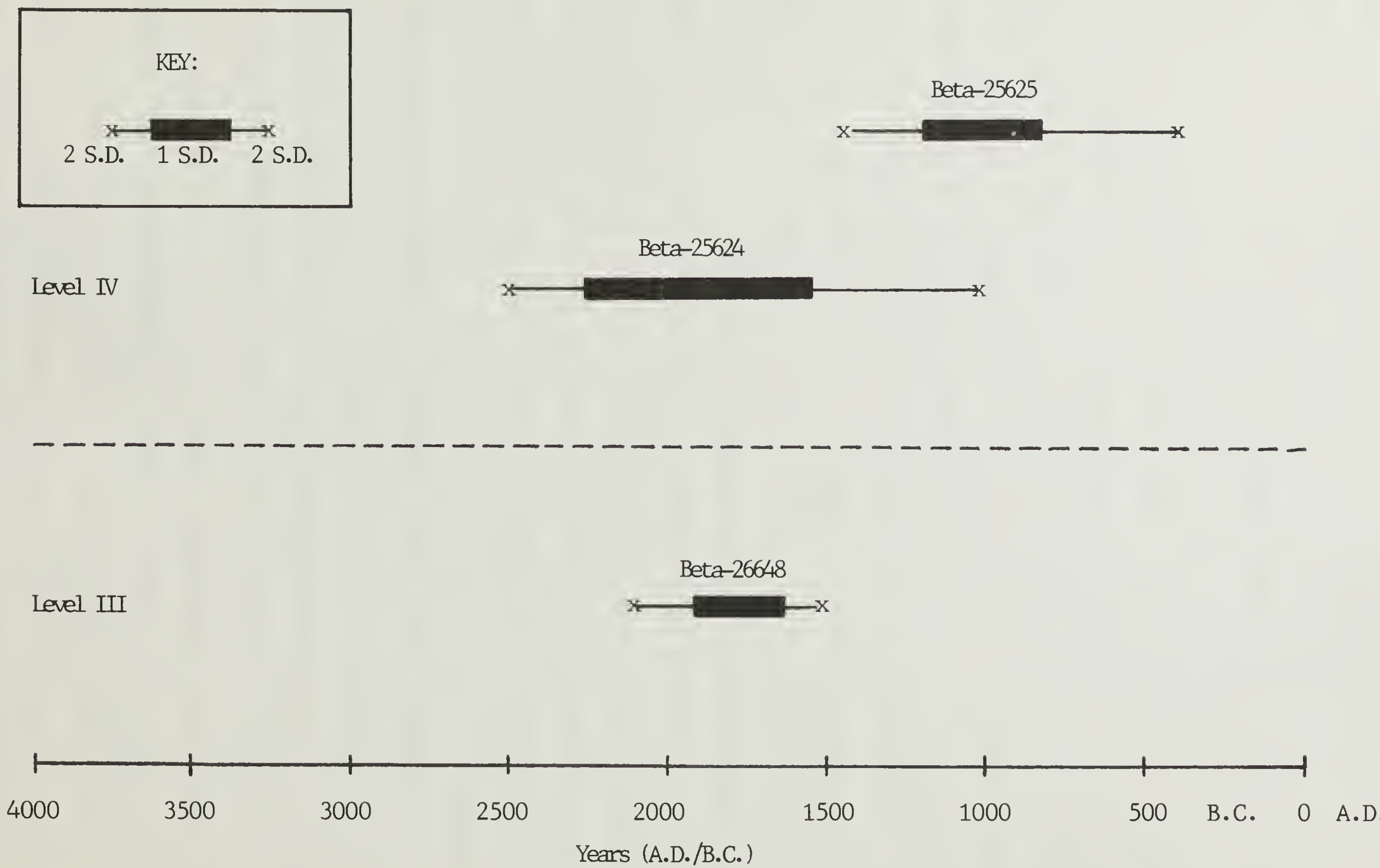


Figure 36. Calibrated age ranges of radiocarbon samples from the Harris Site.

slightly deeper than the radiocarbon sample and justifies the estimate.

The stratigraphic placement of projectile points in Unit 2 is not so neatly arranged. An Archaic point at the bottom of the level is followed by a late Paleoindian type, two Late Prehistoric types, and then a Late Prehistoric type and an Archaic type at the top of the sequence. I think this distribution strengthens the interpretation made above that later peoples picked up and reused the projectile points made by earlier groups.

Scattered across the surface of the site outside the rock-shelter is a low density scatter of lithic materials. Four projectile points were found in this surface assemblage, and identified to specific regional types. The age spans of these artifacts suggest an occupation which might have persisted from 6000 B.C. to A.D. 1300. This span is highly unlikely, given the provenience of the artifacts and the chronometric data collected from the test excavations. More likely, we have another example of later peoples picking up and using points from an earlier occupation -- or even carried in from another location. The aboriginals who most likely visited the site area last were probably Utes. The recovery of metal cans, a metal spoon, a rifle cartridge, a length of chain, and seed beads within a small area on the south side of the drainage confirms this supposition. The latter three artifacts are particularly convincing: the rifle cartridge has a headstamp dated April 1879, the length of chain is part of a nineteenth century Spanish ring spade bit, and the beads are types manufactured for the Indian trade between ca. 1840 and

1890 to 1910. These three pieces of evidence suggest that a small party of Utes, probably men, camped at the site, with their horses, sometime between the middle of 1879 and the end of 1881. All Utes were removed to the Utah reservation in 1882.

It is worth noting that a nearly complete ring spade bit and literally thousands of glass beads were recovered from a Ute crevice burial in Pariette Draw in Uintah County, Utah (Fike and Phillips 1984). Analyses determined that the interred individual was an adult male, 27 to 30 years of age, about 5'8" tall, who may have died of tuberculosis (Fike and Phillips 1984:124). The individual was buried with a sizable number of goods, most of them of Euro-American manufacture. The age ranges of the datable artifacts overlap during the period 1850-1875 (Scott 1984:67). The implications of this burial relative to the Harris Site are that some of the same artifacts were found at the latter, in close proximity to Feature B, an anomalous arrangement of rock. Future work at the site should explore the possibility that this feature is a Ute burial.

Considered together, the chronometric and artifactual data indicate that the Harris Site was first occupied about 3500 years ago, near the beginning of the Late Period of the Archaic of the Uncompahgre Technocomplex (Horn et al. 1987). Except for a brief interruption at the beginning of the occupation, aboriginal peoples apparently stayed continuously at, or else returned regularly to, the site for a period of at least 700 years, and probably longer. The last aboriginal use of the site occurred sometime between A.D. 1879 and 1881 by a small group of horse-mounted Utes who camped briefly at the site on the terrace opposite the rockshelter.

Reconstruction of the Regional Paleoenvironment

Three pieces of evidence were used to interpret what paleoenvironmental conditions might have been like in the region surrounding the site: macrobotanical remains, pollen, and geological sediments. These interpretations can be compared with those obtained from nearby regions to obtain a broader picture.

Very few macrobotanical remains were recovered from the test excavations. Pieces of juniper wood were collected from both Units 1 and 3. The piece collected from Unit 1 came from the same level as radiocarbon sample Beta-25625, with a calibrated age range of 1210-663 B.C. The other specimen was found in Feature 2 of Unit 3, from which radiocarbon sample Beta-26648 with a calibrated age range of 1919-1642 B.C. was recovered. The aboriginal inhabitants are presumed to have used the wood for fuel (Appendix D). These results suggest that the composition of the surrounding vegetation community, at these periods in time, was not greatly different from the present.

The suite of pollen samples collected from the stratigraphic profile of Unit 3 provides a detailed record of the fluctuations in the composition of the local vegetation -- and by extrapolation, the climate -- as sediments accumulated on the site. As shown in Figure 35, pollen samples were collected from each of the stratigraphic levels, except Level V. The correlation of these pollen samples with the two radiocarbon estimates provides a rough chronology for the pollen sequence.

Sample F.S. 249 is bracketed between the two dates, suggesting that the pollen from this sample is about 3500 years old. Four pollen samples were taken from below this dated level, and three came from above it. Analysis of the pollen record (Appendix E) indicates, then, that prior to 3500 years ago, the climate was initially cooler and/or more mesic, as indicated by the large quantities of pine pollen. Sometime thereafter, the frequencies of pine pollen decreased abruptly and the Cheno-ams (shadscale and saltbush) increased greatly. This may reflect a shift to warmer and/or drier conditions, and these conditions persisted until Stratum III. The initial occupation of the site, at about 3500 years ago, occurred during a period when the climate was cooler and moister, as indicated by a dramatic increase in pine pollen and decrease in the Cheno-ams. Juniper pollen also reached a peak at this time, suggesting that the pinyon-juniper woodlands had greatly expanded. Above this level, the pine pollen decreases and Cheno-ams increases once again, indicating that conditions were warm and dry again, much like the present climate.

The climatic sequence interpreted from the Harris Site pollen record compares favorably with other interpretations from western Colorado (see Figure 2E in Appendix E). In particular, the pollen record from the nearby Indian Creek Site (Horn et al. 1987) shows the onset of a cooler climate at about 3500 years ago, which had been preceded by warmer conditions. After this cooler interval, the climate warmed once again, much like it did at the Harris Site. After this time, the more detailed pollen record from the

Indian Creek Site alternates between warm and cool conditions, whereas the Harris Site records only warmer conditions.

The local sediments also contain clues about regional paleoenvironmental conditions. A soil profile taken from a thick sequence of alluvium downstream from the Harris Site revealed a cyclical pattern of deposition (Appendix B). Periods of high energy fluvial deposition were followed by colluvial slopewash and eolian deposition, or a moderate to low energy fluvial deposit. This pattern suggests that the climate fluctuated between cooler and warmer conditions; but, since no chronometric materials were obtained from this profile, the age of these depositional events cannot be determined.

The soil profile obtained from Test Unit 3 provides a depositional sequence which can be correlated with the alluvial sequence and dated approximately. Lamm (Appendix B) posits that the sediments of Test Unit 3 correspond to the upper five soil units of the alluvial sequence. The latter, consisting of conglomerates grading into sands, reflect a transition from high energy, storm-related fluvial deposition to a moderate to low fluvial and eolian deposition. Lamm believes that the sediments found below the midden in Unit 3, i.e. sand and gravels, suggest a moister climate with increased vegetative cover, which would diminish the intensity of storm runoff and decrease the depositional energy levels. Once the site was occupied, about 3500 years ago, the climate became drier, the vegetative cover decreased, and the runoff from storms increased. The stream in front of the site carried a larger bedload and deposited coarser grain materials on the sides of the channel. These deposits were laid down upon colluvial slopewash and later reworked by fluvial and eolian activity. The stream incised its channel and created more habitable living surfaces for the aboriginal groups.

In summary, the macrobotanical, pollen, and sedimentary evidence contained in the site deposits complement each other and clearly point to one conclusion: the local paleoenvironment has fluctuated between cool/moist and warm/dry conditions several times over the last 3500-4500 years. Prior to the occupation of the site, the climate started out as cool and/or moist, but gradually warmed. The initial occupants of the site settled there about 3500 years ago during a cool/moist interval, when the pinyon-juniper woodlands had expanded, and food, water, and fuel were in abundant supply. Then, the climate warmed once again, resulting probably in a decrease in the availability of necessary resources, but not so severe as to force abandonment of the site-- at least, not for long. After this, the climate remained fairly stable and local populations adapted their lifestyles to this climatic regime.

Lifeways of the Site Inhabitants

We have learned that people first settled at the Harris Site about 3500 years ago, and lived there more or less continuously until historic times. We also learned that the local climate was cool and moist during the initial settlement, but gradually warmed and probably stayed warm and dry for the duration of the site occupation. Paleoenvironmental data from nearby sites suggest that this last climatic period may not have been continuously warm, but fluctuated several times between cool/moist and warm/dry conditions. Having established the site chronology, and learned something about the physical context of the site occupation, the final objective is to clarify why the inhabitants settled in this location and what they were doing there. This information can be obtained from several lines of evidence: the site situation, artifactual evidence, and ecofactual materials.

As discussed in Chapter 1, and illustrated in Figures 2 and 9, the Harris Site is located in a small alcove, cut probably by fluvial action in the Dakota sandstone, on the north side of a small canyon, through which an intermittent drainage flows before joining Big Sandy Wash. It lies at the lower edge of the pinyon-juniper woodlands, surrounded by open areas of sagebrush, salt-bush, and greasewood, and only 10 km from the riparian habitat of the Uncompahgre River. The alcove faces southeast, ideally situated to receive the maximum amount of sunshine, but only during certain times of the year. The summer would have been much too hot for people to stay long at the site, and the south wall of the canyon permits only a few hours of sunshine during the winter months. Only during the spring and fall were temperatures comfortable enough for habitation at the site. It is probably not coincidental that spring and fall are also the times of the year when the local mule deer and elk were migrating between their winter and summer ranges. Many kinds of plants are also available around the site during these times of the year; to name just a few: goosefoot and pigweed greens in the spring, their seeds in the late summer and fall; saltbush seeds in mid-fall; and, prickly pear fruits during the summer and fall (Appendix E). Thus, all available evidence points to a bi-seasonal, spring and fall, occupation of the Harris Site, during which time the inhabitants were hunting large game and gathering local plants.

A wide range of artifact types were recovered from the surface of the site and from the excavations. Individually and collectively, these artifact types provide clues about activities that might have taken place at the site. Groundstone (manos and metates) is relatively abundant in the surface assemblage (30 pieces) and from Units 1 and 2 (26 pieces). Many of these pieces are fragments, so it is difficult to determine how many whole artifacts this sample represents. Their abundance clearly suggests, however, that the processing of vegetal resources at the site was an important activity. Moreover, their presence in nearly all of the excavation levels suggests that the preparation of plant foods was a temporally persistent activity pattern. Since none of the groundstone fragments were subjected to a pollen wash, it is uncertain what plants were actually prepared. More than likely, however, it was many of the plants identified in the macrobotanical and pollen analyses (see below).

Chipped stone is the most common artifact class found at the site, comprising about 99 percent of the total assemblage. Among the chipped stone, the by-products of stone manufacture -- cores and flakes -- are most numerous, having 88 percent of the surface assemblage and 99 percent of the excavated materials. The predominance of flakes in all of the excavated levels indicates that the manufacture of stone tools has been a principal activity of the site inhabitants throughout the occupation. If this interpretation is accurate -- and there is no reason to suppose that it is not -- then the number of prepared tools found at the site is extremely low. This is probably attributable to the limited nature of the test excavations and the fact that the test units were placed in the site midden where most of the occupational "waste" was deposited. To put this paucity of prepared tools at the Harris Site in perspective, excavations at the nearby Indian Creek Site recovered 2,239 artifacts, and approximately 80 percent of these are flakes (Horn et al. 1987:Chapter 6). Their excavations covered a broader area (100 square meters) but were placed not in the midden but in a primary habitation area. It seems logical in such a situation that one would find more prepared tools and fewer by-products of tool manufacture.

A closer examination of the prepared tools may provide some insights into the lithic manufacturing behavior of the Harris Site inhabitants. Thomas (1983) introduced a simple graphic technique for analyzing the variability in the bifacial tools recovered from Gatecliff Shelter in Nevada. Based upon Muto's (1971) concept of the blank-preform-product continuum, Thomas categorized the bifaces from Gatecliff as a sequence of technological types: from cores and roughouts, through rough and fine percussion blanks and preforms, to finished products. He then constructed a series of cumulative curves which express the relative proportions of each technological stage in an assemblage. According to Thomas (1983:419-420), the ideal biface reduction curve should have equal proportions of each technological stage; the ideal quarry curve should contain only the initial stages of biface reduction, cores and roughouts; and, the ideal repair curve will have only the finished products. To test this concept, he constructed biface technology profiles for Gatecliff Shelter and several other sites in the Great Basin. The resulting graphs illustrate distinct differences in the bifacial tool strategies for these sites, ones which closely match interpretations derived from other site data.

Table 33 summarizes the frequencies and cumulative percentages of each technological stage in the biface assemblages from the site surface, and from the cultural midden (Stratum IV) in Units 1 and 2. (Unit 3 is not included because only one biface was recovered.) Cumulative curves are computed from these proportions and plotted in Figure 37. The shapes of these curves can be used to interpret the bifacial technology strategies for the site as a whole, and between the surface and subsurface assemblages.

Both curves closely approximate the ideal Biface Reduction Curve. The surface assemblage has a greater proportion of finished tools, which deflects the curve slightly in the direction of the Ideal Repair Curve. In contrast, the assemblage from Units 1 and 2 has more Stage I bifaces and its curve is correspondingly bent towards the Ideal Quarry Curve. Are these differences significant, however? The Kolmogorov-Smirnov two-sample test is an appropriate statistical method for comparing two cumulative curves (Thomas 1976). The null hypothesis states that the cumulative percentages of the surface sample is not significantly different from those of the subsurface sample. The larger the

Table 33 Computations for Biface Technological Profiles from the Site Surface and Stratum IV in Units 1 and 2

Technological Stage	Surface			Stratum IV			Difference Between Cum. %s
	Frequency	Cumulative Frequency	Cumulative Percentage	Frequency	Cumulative Frequency	Cumulative Percentage	
STAGE I cores & roughouts	4	4	25	22	22	38	- 0.13 D_{max}
STAGE II rough percussion blanks	4	8	50	6	28	48	0.02
STAGE III fine percussion blanks	1	9	56	10	38	66	- 0.10
STAGE IV preforms	2	11	69	6	44	76	- 0.07
STAGE V finished products	5	16	100	13	57	100	0.00
TOTALS	16			57			

Note: D_{max} is the absolute maximum difference between the cumulative percentages of the two samples.

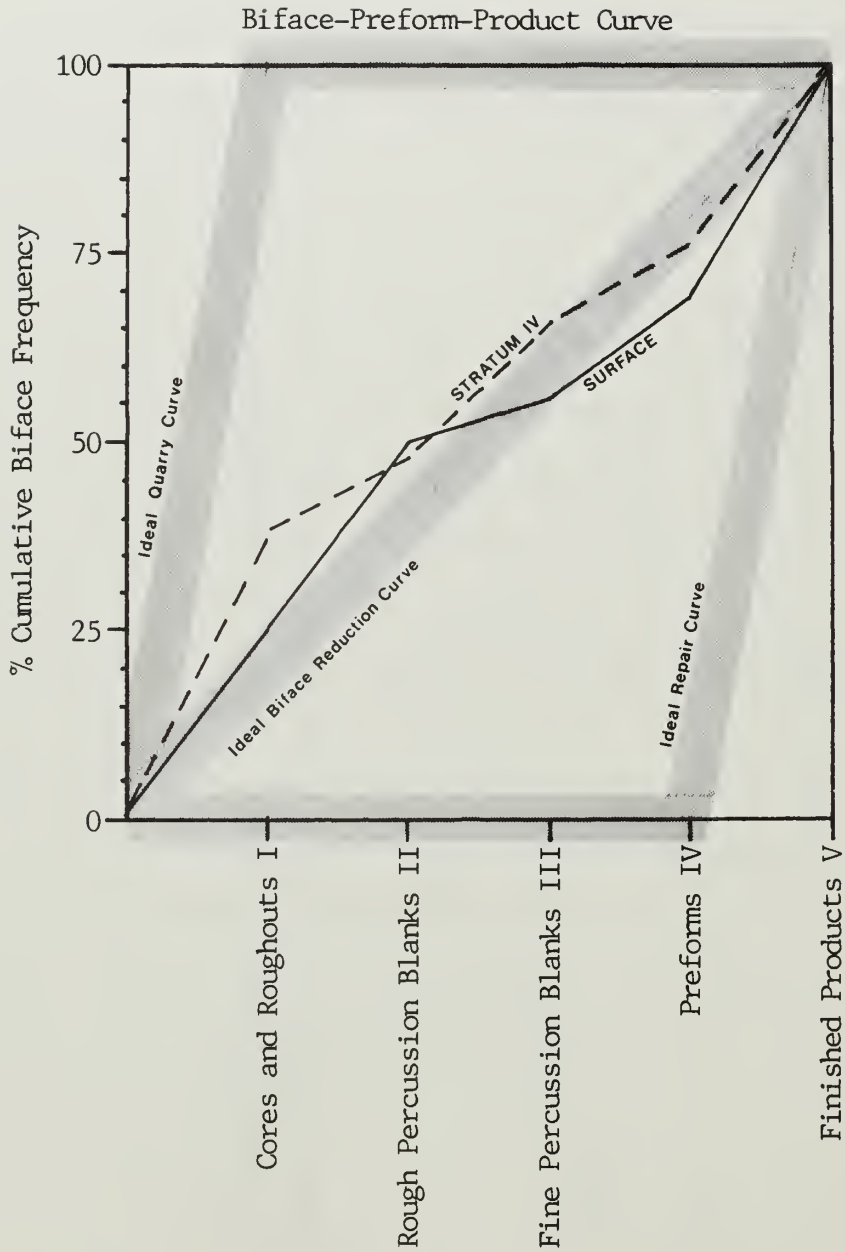


Figure 37. Biface technology profiles for the site surface and Stratum IV in Units 1 and 2.

maximum absolute differences between the percentages, the more likely that the null hypothesis would have to be rejected. At the 0.05 level of rejection, the critical value of the Kolmogorov-Smirnov statistic is as follows:

$$D_{.05} = 1.36 \sqrt{\frac{n_1 + n_2}{n_1 n_2}}$$

where n_1 is the frequency of the surface sample and n_2 is the frequency of the buried sample. Substituting the appropriate numbers into this equation, the obtained critical value of $D_{.05}$ is 0.385. Thus, if the maximum difference between any of the proportions exceeds this value, then the null hypothesis can be rejected. The maximum difference between the proportions of the two samples is -0.13 for the Stage I bifaces (see Table 33). Since this actual D is less than $D_{.05}$, the two curves are considered to be essentially identical.

This statistical exercise has demonstrated that some of the occupants of the Harris Site were principally engaged in the reduction of raw materials into bifacial tools. They stayed long enough at the site to produce all stages of manufacture, and this pattern is temporally persistent.

The abundant amount of rock art on the cliff face behind the site bespeaks the importance that the site occupants placed in these symbolic representations. These petroglyphs, arranged in six panels, are incised or ground into the soft Dakota sandstone. Cole postulates that the elements were made with either stone or bone tools, but the latter is problematic since no bone tools were found in the site deposits. A stone tool (Cat. No. 45) was found, however, which exhibits the kind of wear patterns one might expect to find on a tool used to incise lines into rock. A similarly worn flake was found at the Moore Site, which has petroglyphs very similar to those of the Harris Site. The elements in the panels are mostly abstract, with a few zoomorphic elements. The abstract elements are representative of the Uncompahgre Style category of rock art, a style which previously has been dated in the region between approximately 1000 B.C. and A.D. 1300. The recovery of a rock fragment with incised abstract lines on its face (Cat. No. 291) from Unit 1 at a depth of 40 cm below the original ground surface, below a radiocarbon sample with a calibrated age range of 3159-2612 B.C., suggests strongly that the temporal span of the Uncompahgre Style can be pushed back at least 1,600 years. The zoomorphic elements were probably made by Proto-Historic or Historic Ute Indians.

The last pieces to fit into the puzzle of site function are the ecofactual materials. These include animal bone, macrobotanical remains, and the pollen evidence. A sizable number of animal bone was recovered from Units 1 and 2; a much smaller amount came from Unit 3. Less than 10 percent of the bone could be identified to genus level; the remainder could be identified only to gross categories of large or medium mammal, and general mammal; some bones were simply unidentifiable. The species which could be identified are cottontail rabbit, jackrabbit, and ground squirrel. The cottontail rabbits at least were used for food since a burned scapula from one of these animals was found. More than a third of the general and unidentifiable bone is splintered and burned.

Rood concludes from his analysis of the faunal materials (Appendix F) that these bones were broken to obtain the marrow and to produce bone grease. It is notable that about 70 percent of the bone was recovered from the lower levels of Units 1 and 2, below the 2730$\pm$200 BP radiocarbon date. This observation suggests that faunal procurement and processing was an important activity during the initial occupations of the site, but declined somewhat thereafter.

Pieces of charred dicot and juniper wood were recovered from Units 1 and 3. There is probably no question that this wood was gathered from nearby trees and used for fuel. Three charred goosefoot seeds were identified in a flotation sample taken from Feature 1 in Unit 3. Although she hesitates to infer much about the economic activities of the site's inhabitants from such a small sample, Matthews (Appendix D) considers it likely that these plants were procured nearby and processed at the site.

The pollen record contains little direct evidence of subsistence activity. Scott (Appendix E) believes, however, that due to the sizable quantities of Cheno-am pollen observed in the cultural midden, the site occupants were using and discarding the seeds and greens of goosefoot and pigweed. These plants are weedy annuals which flourish in disturbed soil, such as exists in middens. Saltbush may also have been exploited for both its greens and seeds. The appearance of prickly pear cactus in the midden suggests to Scott that the pads and/or fruit were collected and eaten.

The combined situational, artifactual, and ecofactual evidence indicates that the Harris Site has been a desirable habitation for local aboriginal groups for a long period of time. It is probably too hot during the summer, and too cold during the winter, but spring and fall would have been pleasant times to camp at this locality. Migrating herds of deer and elk most likely passed nearby, a wide variety of edible plants grew close-by, and local trees provided ample supplies of firewood. The plants were brought back to the site where their seeds were ground into flour or stored, and the greens eaten raw or used as pot herbs. Various small, medium, and large mammals were caught by the site inhabitants, returned to the site to be butchered and apportioned, and eaten. The bones were cracked open to obtain the marrow, and bone grease was produced. This seemingly idyllic existence may have persisted for millennia. It is equally likely, however, that a warming climate may have lessened the attractiveness of this locale: the large game may have moved to higher elevations, plant resources diminished in the vicinity of the site, and local water holes dried. Further work at the site may some day clarify these issues.

VIII

MANAGEMENT RECOMMENDATIONS

When the CAS Chipeta Chapter began research efforts at the Harris Site, we were convinced that the site had great potential to yield important information on the prehistory of this region. As the preceding pages have demonstrated, this conviction has been borne out, even though a very small fraction of the site deposits have actually been examined. I believe that the site is potentially eligible for inclusion on the National Register of Historic Places (NRHP). There is much more to learn from the site, however, and it is still vulnerable to despoliation by vandals. In this concluding section, I would like to describe some potentially productive areas of future investigations at the site. I shall also propose some measures to protect this valuable site from further disturbances.

Future Investigations

The archaeological work so far completed at the Harris Site has achieved the following results: the surface manifestations have been completely mapped and described; all visible surface artifacts have been collected; the rock art has been described, photographed, and sketched; the nature of the subsurface deposits have been generally characterized; a tentative occupational chronology has been deduced; and, valuable insights into paleoenvironmental conditions and the lifeways of the prehistoric inhabitants have been gained. But, as already mentioned, only a small portion of the site's potential has been tapped, and so much more can be learned.

One unexpected bonus of our efforts at the site was the recognition of a historic Ute component on the alluvial terrace opposite the shelter. Evidence for this occupation consisted of several items of historic or native manufacture: several hole-in-top metal cans, a metal spoon, a length of chain, a cartridge, and a dozen seed beads. The historical archaeologist who analyzed these artifacts is quite confident that they were deposited by a small group of horse-mounted Utes who camped at this location for a short time, possibly overnight, sometime between the middle of 1879 and the end of 1881. Together with the adjacent site 5MN3446 (a historic petroglyph depicting a white man in a top hat, with a "shield" on his chest, and a horse figure), this locality is one of the few on the Uncompahgre Plateau that can be reliably associated with the Ute peoples. As Buckles (1971:1248-1273) points out in his discussion of the Ute manifestations on the Uncompahgre Plateau (his Escalante Phase), Ute sites are very difficult to define, notably because the Utes followed a seasonally nomadic pattern of hunting and gathering which differs very little from the Archaic inhabitants of the area; hence, their sites are sometimes impossible to distinguish from earlier manifestations. Only when the remains of wickiups, so-called Ute ceramics, burials, certain types of projectile points, or rock art with horses and historic figures are found, can a Ute affiliation be assigned with any confidence. Thus, this Ute component at the Harris Site is a valuable resource.

In view of its significance, this area should be investigated further in the following manner. The baseline established on the north side of the site should be extended south across the drainage to the alluvial terrace. From this baseline, a grid can be laid out which fully encompasses the area where the historic artifacts were found. Next, several people would walk carefully across the area, sweeping it with metal detectors. Where a metal item is detected, that spot would be marked with a pin flag. After this sweep had been completed, any clusterings of pin flags would be noted and a one square meter test unit established over each cluster. Several other test units could be placed in random locations across the terrace. In addition, a larger two square meters unit should be placed over Feature B, a stone alignment at the western edge of the site, in order to determine its function and association with the historic artifacts. As noted in Chapter 7, there is a possibility that Feature B is a Ute burial. All test units would be excavated to a sterile layer and the deposits carefully screened.

At some future date, I think some effort should be expended to explore further the shelter deposits. For this effort, I think it would be desirable to excavate several contiguous test units across the front of the shelter. The vandal's pit could be incorporated into this excavation plan. The emphasis of these excavations would be to expose a larger area horizontally, and thereby achieve some insights into the spatial relationships of previous occupations.

Site Protection Measures

The Harris Site was extensively and methodically vandalized. These vandals removed at least 20 cubic meters of dirt from the best part of the site, screened the excavated dirt, and collected an unknown, but probably sizable, number of artifacts. That it was vandalized is not in itself unusual: many sites in the region, state, and nation are disturbed and/or destroyed every year. What is somewhat unique about this site is that the vandals carefully screened their dirt, implying that they knew something about such sites and how to maximize their "haul". What can be done to forestall further digging at the Harris Site, and at other archaeological sites in the region?

This is a complex problem, as Nickens et al (1981) discovered in their survey of vandalism in southwestern Colorado. They found that people collect and dig archaeological sites for a variety of reasons: for recreation, as a family outing; to add pieces to their collection, which many regard as family heirlooms; or, to learn something about the early inhabitants of the region. Very few of these people are commercial artifact hunters; that is, acquiring antiquities for profit. Many, in fact, decry this form of artifact collecting, if for no other reason than that this practice removes these items from the area, to everyone's loss. Many know that it is illegal to collect and dig on public lands and recognize the obligation of the government to protect archaeological sites and to prosecute those who disregard the laws.

Nickens et al. (1981:134-143) recommend that federal land management agencies (in this case, the Bureau of Land Management) take an active role in protecting the cultural resources under their care by : (1) patrolling their area, on the ground and in the air; (2) pursuing convictions of antiquity violations; and (3) educating the public. Each of these recommendations has merit vis a vis the Harris Site.

Once they were aware of the problem, the Montrose District office of the Bureau of Land Management (BLM) responded quickly and forcefully to protect the site and to try and catch the vandals. I believe that their efforts, plus the highly visible presence of the Chipeta Chapter research team on the site, resulted in the discontinuation of further vandalism after our investigations had begun. Of course, it is likely that the vandals were not too concerned about having to quit their efforts at the Harris Site since they had already acquired many "goodies". It may also be true that they are simply waiting for the commotion to die down before they return to the site.

In view of the latter possibility, I believe that the BLM should continue (or resume) ground and air patrols of the Harris Site vicinity to try and catch vandals "in the act". Air patrols, preferably by helicopter and possibly conducted in cooperation with the county sheriff, are arguably the most effective way to stop the vandalism of sites. The BLM may also want to consider fencing the site, particularly the shelter area and the rock art panels. A fence would keep out most of those whom the air patrols miss. These measures require a not-insignificant investment of funds, particularly the air patrols.

Which brings up the last recommendation. I believe that an active educational process is the most effective way, in the long run, to decrease the vandalism of archaeological sites, and it should yield the most rewards. And, I can think of no better group of educators than the members of the Chipeta Chapter. Though many of them started out as collectors, all now recognize the damage that illicit collecting and digging can do to an archaeological site, and they understand why professional archaeologists must meticulously explore a site. Many are long-time residents of the community and can interact effectively with local residents. A small group of these avocational archaeologists, those who can speak effectively and comfortably in front of large groups, should go out to community groups and local schools, describe the work completed at the Harris Site, explain the significance of the results, and advocate its protection. Popular articles can be written for the local newspapers, and educational newsbriefs can be prepared for radio and television stations. I believe the results will be most gratifying.

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APPENDICES

APPENDIX A

ROCK ART AT 5MN2341, THE HARRIS SITE

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June 1988

ROCK ART AT 5MN2341, THE HARRIS SITE

This report will describe and discuss petroglyphs at site 5MN2341, the Harris Site, which is located on the eastern slope of the Uncompahgre Plateau in west-central Colorado. The archaeological context of the site is reported in detail in the excavation report of which this is a part, and data relevant to the rock art study will be referenced.

Site Situation

Petroglyphs are present in seven panels at 5MN2341 and are exhibited inside and near a rockshelter which has been formed in the sandstone wall of a shallow canyon draining east to the Uncompahgre River. The rockshelter and the rock art panels generally have a southern aspect (Figure A1). The sandstone is in the Burro Canyon geological formation. The sandstone background for petroglyph Panels A–F corresponds with Munsell Soil Color numbers 10YR8/4 (very pale brown), 10YR7/6 (yellow) and 7YR8/2 (pinkish white). The patination on the sandstone within the rock shelter and on the cliff wall is very light in color, and all of the petroglyphs are patinated to the same degree as the background rock.

Panels A and B are located on the sloping rear wall of the

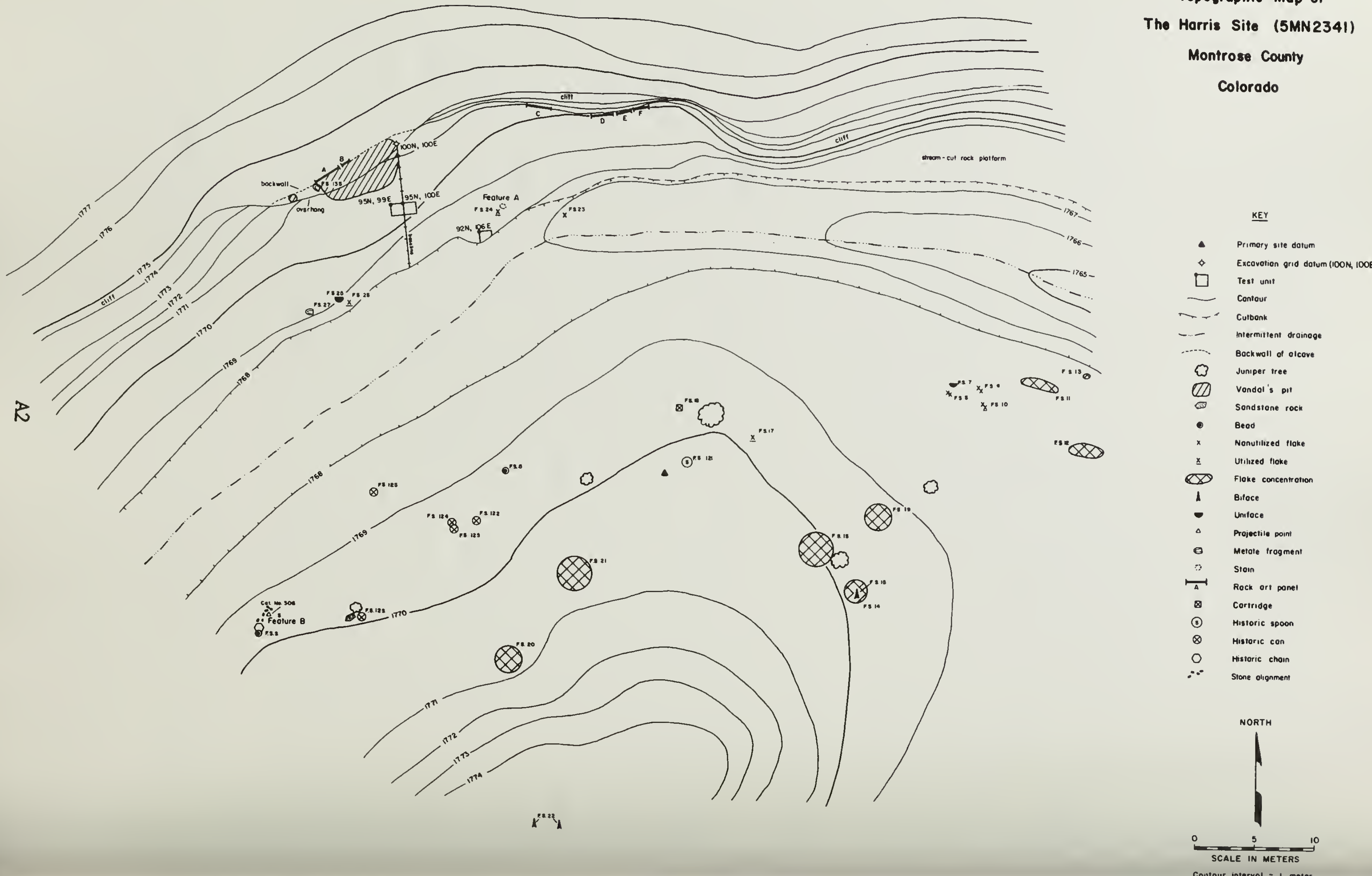
Figure A1

Topographic Map of

The Harris Site (5MN2341)

Montrose County

Colorado



rockshelter, and panels C-F are located seven or more meters east along the cliff wall (Figures A2-A7). Panel G (Cat. no. 279) was located during excavation of the rockshelter and apparently is a portion of bedrock, a boulder or a stone slab which once was exposed in the shelter and has since been covered by soil deposition (Figure A8). The bedrock, boulder or slab remains buried, and the extent of any buried petroglyphs is unknown.

Site Chronology

Two chronometric dates are associated with 5MN2341. The dates are estimates on radiocarbon samples sent to Beta Analytic. The age estimates are 3510±270BP (sample 282) and 2730±200 BP (sample 291). Of the two estimated dates, the one of particular interest in regard to rock art at the site is that of sample 291. The sample was collected approximately 40 cm below the present ground surface in an excavated unit near the rockshelter. The sample was collected from Cultural Layer 1, Unit 95N, 99E (Gordon C. Tucker, personal correspondence).

Panel G, the broken rock slab which exhibits petroglyphs, was found at approximately 70 cm below present ground surface in excavation unit 95N, 99E. Based upon stratigraphic position, it is estimated that the rock slab and the petroglyphs are at least 2,700 years old and possibly older (Gordon C. Tucker, personal correspondence).

The petroglyphs of Panel G are typologically similar to the

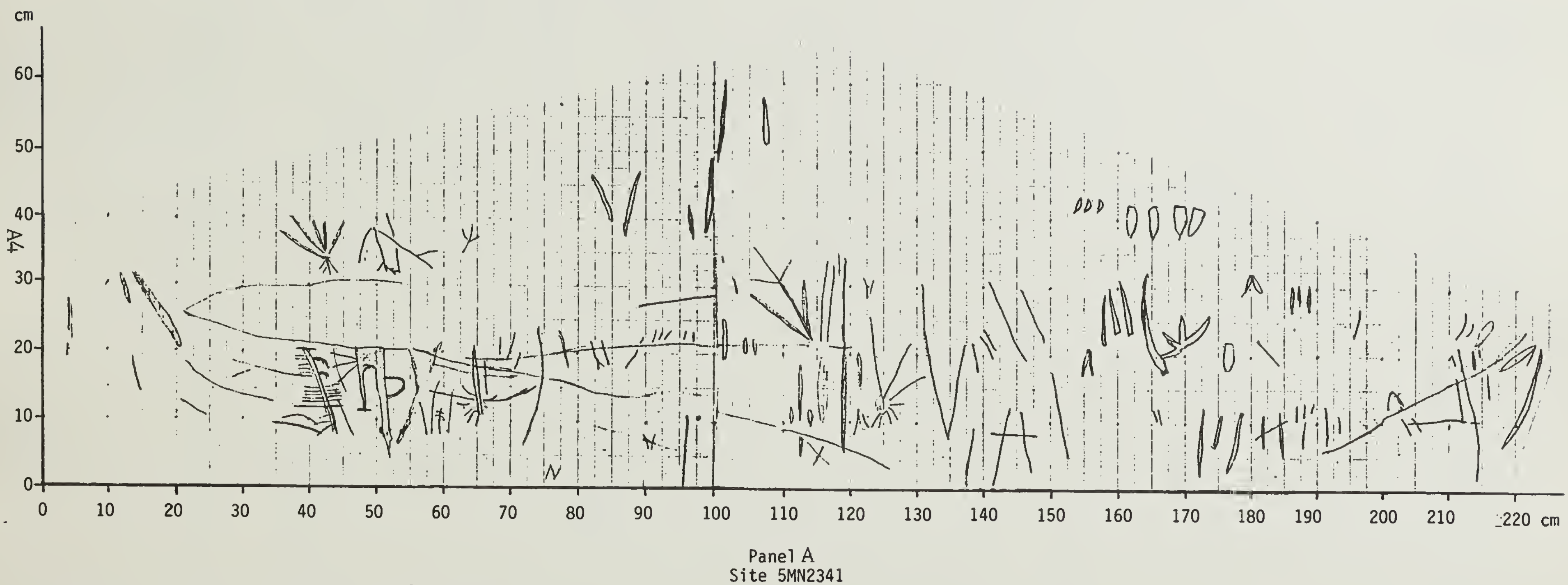
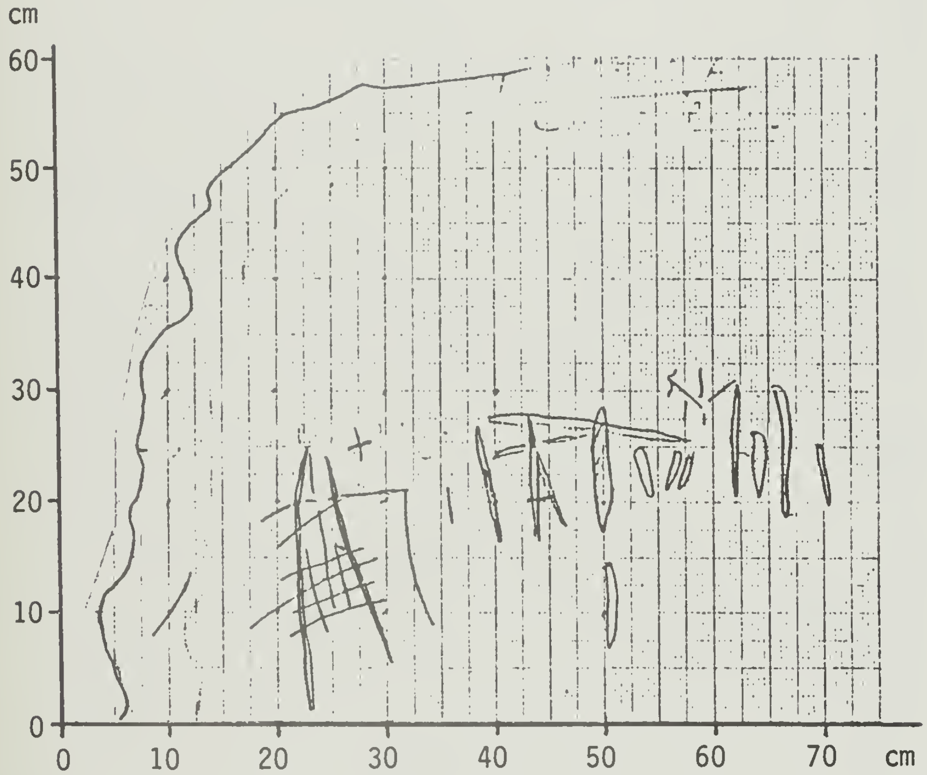
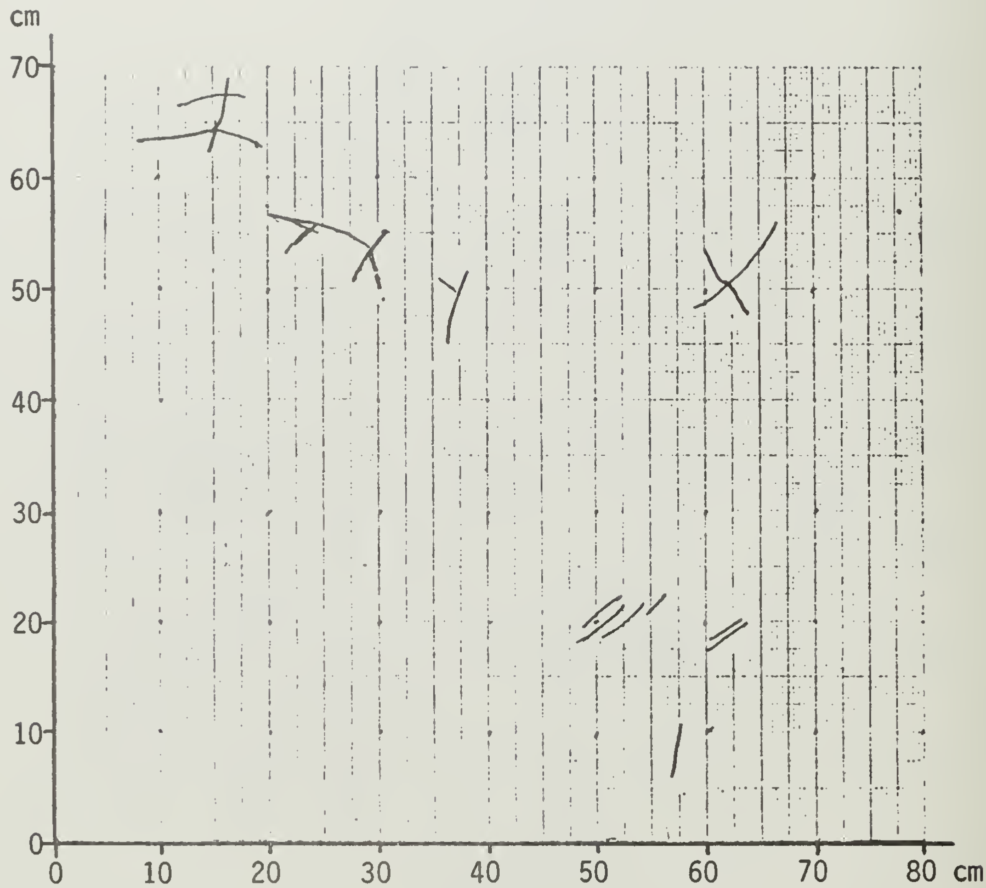


Figure A2. Sketch of rock art Panel A.



Panel B
Site 5MN2341

Figure A3. Sketch of rock art Panel B.



Panel C
Site 5MN2341

Figure A4. Sketch of rock art Panel C.

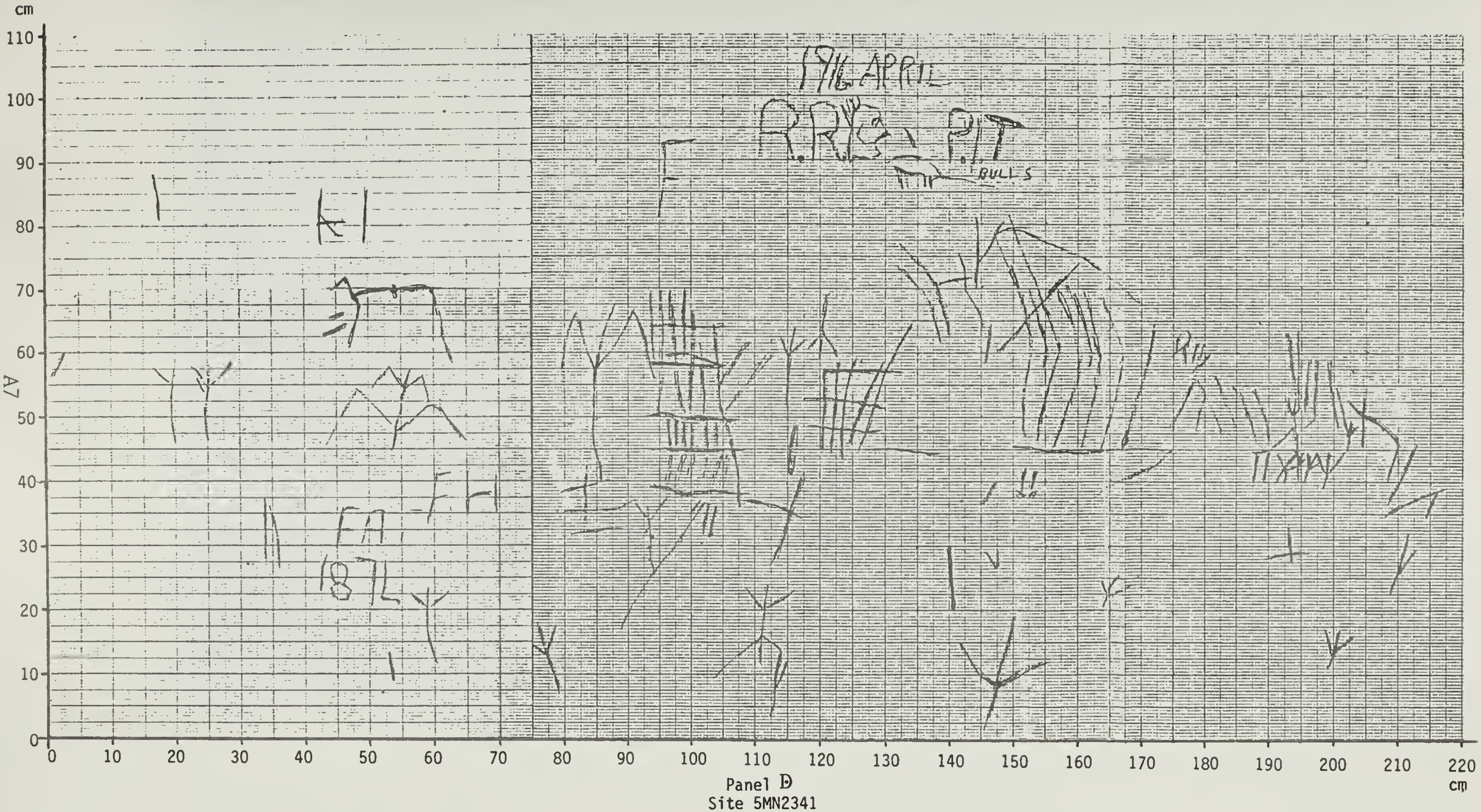


Figure A5. Sketch of rock art Panel D.

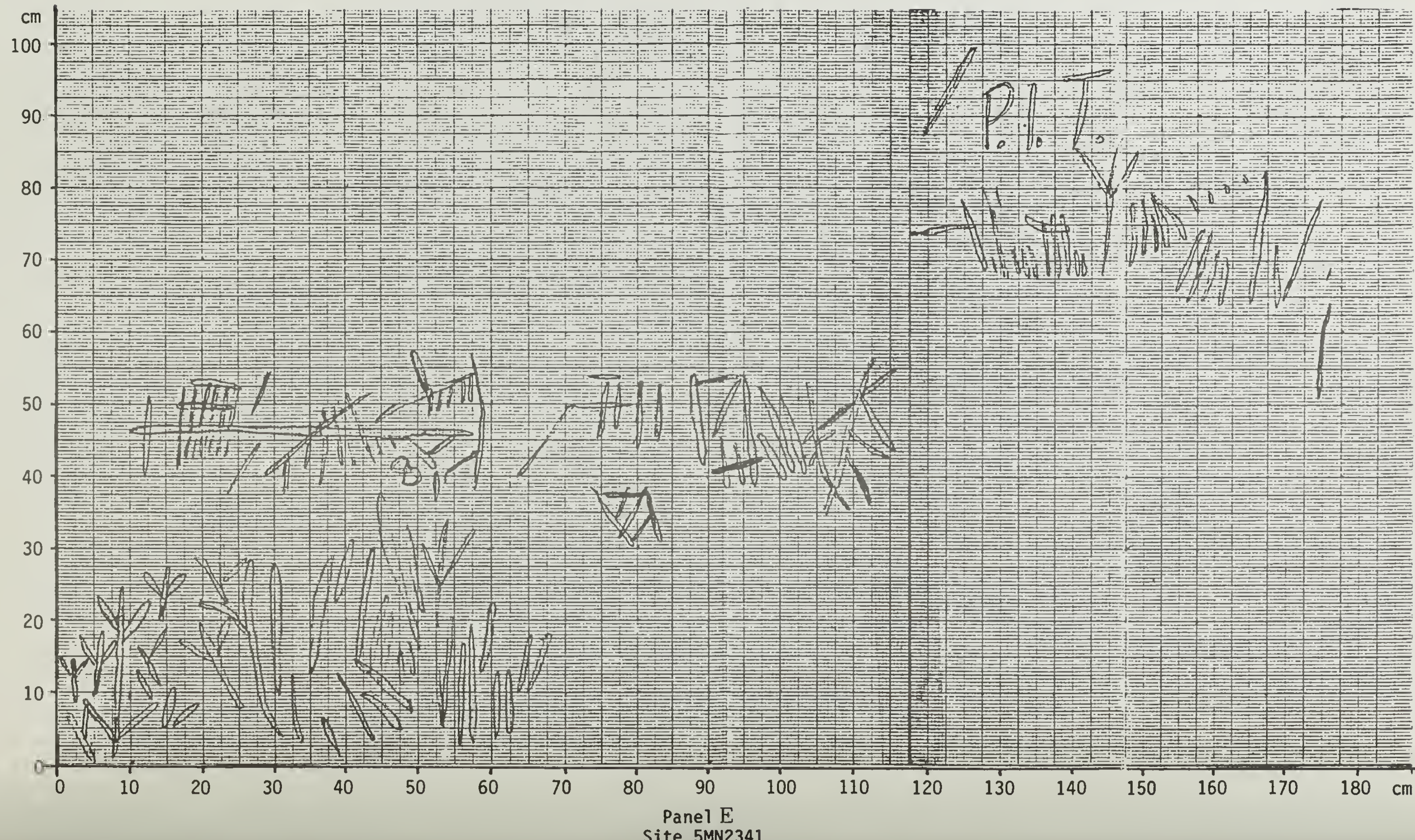


Figure A6. Sketch of rock art Panel E.

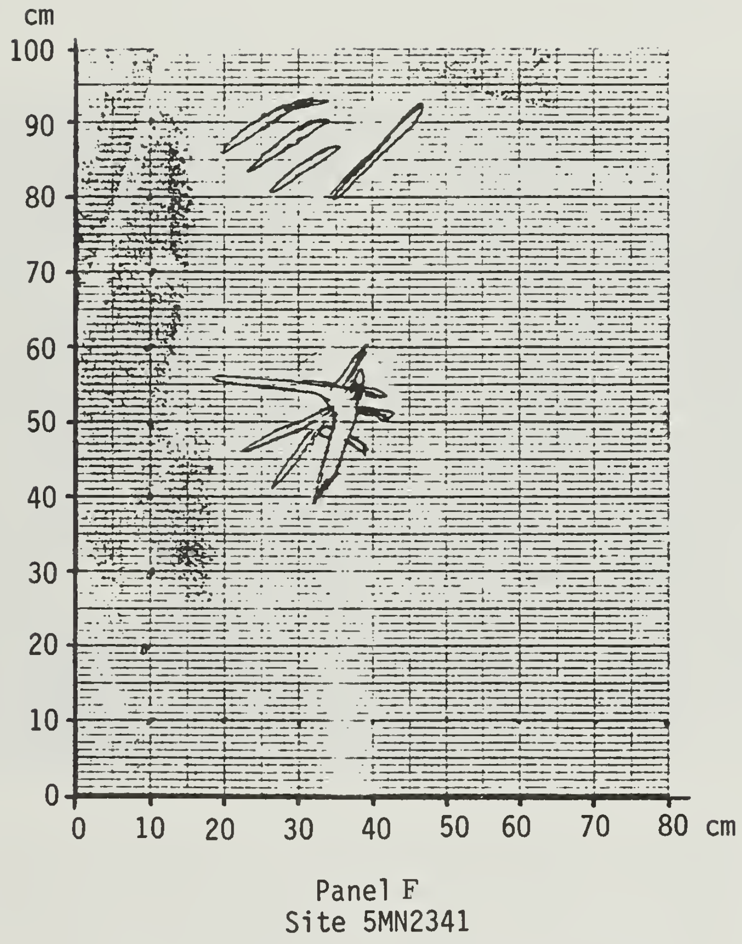


Figure A7. Sketch of rock art Panel F.

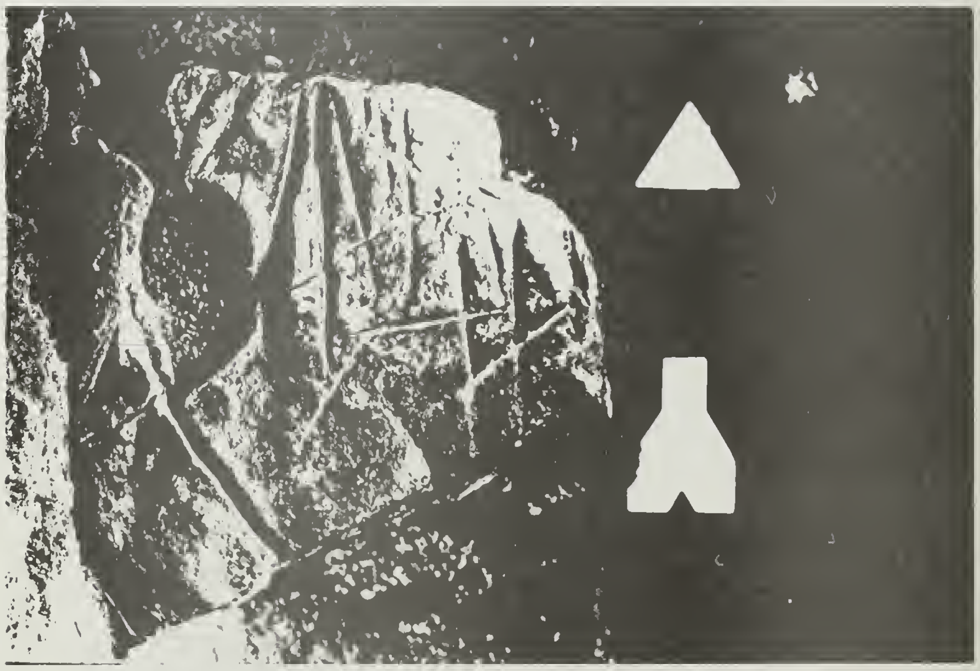


Figure A8. Photograph of rock art Panel G, stone slab with incised lines on its surface (Cat. No. 279), found in situ in Test Unit 95N, 99E. Arrow points north, and black bar is 10 cm long.

majority of the petroglyphs found elsewhere at the site and will be discussed below in that context. It is fortuitous that the excavations at 5MN2341 exposed the buried petroglyphs not only for the possibility it affords to have chronological control on petroglyphs at that site but the opportunity is offers for developing a chronology for stylistically related rock art of the region. Dates for such rock art in the past have been proposed based on cultural associations and similarities with better understood rock art from adjacent regions.

Apparently, the buried rock art rested on or protruded into what was a living floor 2700 or more years ago. It seems probable that at least some of the rock art found in Panels A–F also dates from that period or earlier and is culturally as well as temporally related to the art of Panel G.

Technology Discussion

Petroglyphs at 5MN2341 are defined as either incised or ground and appear as individual grooves, groupings of the same and representational images. Incised grooves are narrow and sharp, and ground grooves are wider and approximately elliptical in shape. Feyhl (1980:1-31) has experimented with replication and described techniques for the manufacture of similar grooves in sandstone which are common in rock art of the Great Plains and elsewhere in North America. Feyhl's replication experiments were approached from the perspective of the modification of tools rather than grooves. Essentially, the sharp narrow incisions are viewed as being made by a hard sharpened tool, probably a stone. The broader grooves are proposed to have been formed by wet bone and antler-ends. Feyhl has proposed that the process of bone and antler-end modification is a likely reason for the existence of the broad elliptical grooves. Numerous such grooves result from the tool modification process as fresh abrasive surfaces are needed to achieve desired tool shapes. In particular, rows of parallel grooves and fan-like arrangements of grooves are proposed by Feyhl (1980) to result from the maker finding a comfortable position and suitable angle from which to grind the rock surface. Parallel rows of grooves and fan-like arrangements of grooves occur in a few instances in Panels A-F at 5MN2341.

Feyhl acknowledges that both narrow and broad grooves are sometimes incorporated into recognizable rock art images, and he views this as a separate use for groove technology without examining how tool modification may or may not enter into the process. Feyhl does not discuss the possibility that the shaping of tools and making rock art images may in some cases have been combined by artists into single events or the types of tools which may have been used if the sole intention of the artists was to make grooves or rock art rather than to shape tools. In the latter case, presumably artists would choose to use tools which would not be easily modified such as hard stones or dry bone or antler of various shapes. Indeed, this is consistent with the finding that narrow grooves are likely to have been made by sharpened (flaked?) stones which would have been made dull during the process of grinding and would presumably have limited use as a tool thereafter. Grooves may have been traditional ways for artists to draw lines, equivalent of those which elsewhere are pecked or scratched. In such cases, the making of grooves would be the goal of the artists and would only incidentally relate to the modification of tools.

The use of grooves for making lines in rock art seems likely for rock art at 5MN2341 because very little of the art involves repetitious individual parallel grooves and fan-like arrangements similar to those described by Feyhl, and the petroglyphs include patterned as well as more random appearing groupings of grooves as well as abstract geometric designs and representational elements. Also, the petroglyphs at 5MN2341 are technically and stylistically consistent with pecked and incised rock art elsewhere in west-central Colorado which has a recognizable element content. This will be discussed further below.

Based on Feyhl's work, it is probable that the tools used in the manufacture of petroglyphs at 5MN2341 include sharpened stones, bones and antler. A possible stone rock art incisor (Cat. no. 45) was found on the surface at the site next to a vandal's pit. The incisor is a primary basalt flake with one edge evenly ground bifacially and which could have been used to make the narrow incised grooves at the site. Although bone is reported from 5MN2341, worked or modified bone and antler are absent. This negative evidence is not definitive regarding the use of bone or antler in making grooves at 5MN2341 because much of the site has not been excavated, and tools may have been taken from the site by the artists or by subsequent peoples at the site. However, it may be that stones, both narrow sharpened stones and stones with broader edges, were utilized to make petroglyphs at 5MN2341.

Further support for the use of stones for making grooves at 5MN2341 is provided by archaeological evidence from the Moore Shelter (Wormington and Lister 1956:8-9) which is located a few miles to the southwest and has chronological and cultural associations with 5MN2341 (discussed below). Petroglyphs at the Moore Shelter are similar to those at 5MN2341, and it is noted by the researchers that had the grooves not appeared patterned, it would have seemed probable that the marks were formed by the sharpening of implements. A quartzite flake uncovered during excavation of the Moore Shelter is described as having "one extraordinarily smooth edge" which replication experiments revealed would have made grooves such as those at the site. Additionally, working the grooves produced identical smoothed edges on the flakes used. Bone tool modification such as awl sharpening, cited as being the most likely utilitarian purpose for the grooves at the Moore Shelter, is not supported by the overall archaeological context in which awls are rare.

Rock Art Description and Discussion

Generally, the petroglyphs are of two types which have cultural and chronological as well as iconographic significance.

One type has easily recognizable representations and is associated with historic Euro-Americans and possibly the historic Ute, while remaining rock art predominantly appears abstract and is presumed aboriginal and prehistoric in origin. The latter type predominates at the site and occurs in Panel G which is dated to 2700 years ago or more. The grooves associated with the historic period are more shallow than the earlier, but, there are no obvious distinctions between elements as to the relative age of each based on the repatination of petroglyphs. As noted above, all of the rock art is patinated to the same degree as the background surfaces which are very lightly colored.

Historic Rock Art

Representational petroglyphs occur in Panels D and E and include English names and initials, outline drawings of a face in profile and a quadruped with a line above the back which possibly represents a rider. The names and initials are presumably of Euro-American origin, and the other images may be also. Two possible dates are present, 1916 April and 1871(?). The accuracy of the dates is unknown, but the 1871(?) date is questionable as the Ute Indians were quite active in the area of the site prior to A.D. 1880, and Euro-American populations were limited. No research has been done for this report to trace the source of the Euro-American petroglyphs as the focus of this study is prehistoric aboriginal rock art associated with the site.

The outline face and quadruped in Panel D are exhibited near the 1916 date and English letters, but the various images may not be culturally related, although, they all are made of shallow grooves as opposed to the more deeply incised forms assumed to be prehistoric. The face appears to wear a "feather" headdress formed of lines and shows an outline of what appears to be the jaw. While similar headdresses are associated with Indian apparel in rock art, the profile view and realistic detail of the jaw are not typical of Indian rock art elsewhere in the region, including that of the historic Ute (see Buckles 1971; Cole 1987). This image is probably of Euro-American origin.

The sketchy abstracted quadruped is not unlike bison and horse forms attributed to the historic Ute in western Colorado (Buckles 1971; Cole 1987, 1988). Specifically, such forms are part of the Early Ute Style described by Buckles which is dated between approximately A.D. 1640-1850. If Ute, the quadruped and associated line may represent a horse with abstracted rider or a bison with an arrow or spear above the back. However, the quadruped may have been made by Euro-Americans and be related to the nearby face, English words and dates. Consistent with this suggestion is the fact that the quadruped, like the face and associated English words, has more shallow grooves.

A probable historic Ute archaeological component with artifacts dating from approximately A.D. 1879 was found directly across the drainage from 5MN2341 and may be associated with petroglyphs located on the cliff approximately fifty meters northeast of 5MN2341 (Figure A9). These petroglyphs are solid and

Figure A9. Photograph of Ute rock art, found at site 5MN3446, downstream from the Harris Site.

stipple pecked on darkly patinated sandstone and show the upper portion of an outline anthropomorph and a solidly pecked horse. The anthropomorph wears a solidly pecked top hat and has a circle on the chest area. The horse is elongated with short legs. These petroglyphs are consistent with Late Historic Ute Indian Style rock art (Buckles 1971; Cole 1988) which is proposed to date from after A.D. 1850 to 1880 or later. As such, the dates correspond with those proposed for the Ute site at 5MN2341.

Prehistoric Rock Art

The majority of the petroglyphs at 5MN2341 are single incised or broader ground grooves. In some cases, the grooves occur in groups of presumably related images and symbols, and some appear as part of representational images and geometric designs. Notable among the latter are cross-hatched areas, rake-like designs and a "one-pole ladder" image seen in Panels A-B,.D-E. Possible representational elements include bird tracks and stick-like anthropomorphs exhibited in Panels A, D-E. The possible anthropomorphs in Panel D appear as stick bodies with no heads and straight and bent stick-like appendages. The abstract nature of these prohibits positive identification. However, the bird tracks in Panels A, D, and E are more recognizable. Similar triad images with a longer rear claw or toe impression are common in rock art of the Colorado Plateau where they occur as pecked and painted as well as incised forms.

Superimpositions occur in Panels A-E and G but it is not clear whether the superimposed elements were made at an earlier time or are part of original compositions. Patination levels are equal, and different shaped grooves occur throughout the site and are not consistently associated with superimposed elements from panel to panel. An example is the "one-pole ladder" element in the lower left portion of Panel A (Figure A2) which combines narrow horizontal grooves with a wide vertical groove. One of the narrow grooves is superimposed by a narrow vertical groove. The various elements are obviously intended to relate to one another in function and/or symbol.

It is possible that some of the above elements may have been made by protohistoric or historic Ute Indians. Probable Ute Indian rock art at 5DT1, 5DT4, 5MN14 and 5MN68 (Buckles 1971: Figures 144, 145-147, 148, 151) located approximately ten miles north of 5MN2341 exhibits incised and ground petroglyphs. Also, Ute Indians are reported to have imitated older rock art, and some instances of this are suggested in western Colorado rock art sites (Cole 1988).

Generally, however, the more abstract and deeply incised elements are assumed to be prehistoric in origin and are attributed to peoples of the prehistoric Uncompahgre Complex (Wormington and Lister 1956; Buckles 1971), hunters and gatherers of west-central Colorado and neighboring mountainous regions who have been described as participants in the Uncompahgre technocomplex (Buckles 1971). Black (1986) and Cole (1987) have suggested that peoples of the Uncompahgre Complex are associated with a Mountain Tradition recently described by Black, and Cole notes that some cultural cohesiveness among groups of the technocomplex is suggested by the generalized similarity of the rock art through time.

In a previous study of rock art in west-central Colorado, Cole (1987) has described rock art associated with the Uncompahgre Complex in two style categories, the Abstract Tradition and the Uncompahgre Style. The Abstract Tradition has significant representation in the Great Basin, Southwest and Great Plains and is associated with hunters and gatherers of those areas between approximately 1000 B.C. and A.D. 600 (Cole 1987:35). The Uncompahgre Style is a generalized style category proposed to date between approximately 1000 B.C. and A.D. 1300 (Cole 1987:54) which probably can be divided into various substyles with cultural and temporal significance as a result of additional research. Elements at 5MN2341 such as individual lines, linear geometric designs, bird tracks and simple stick anthropomorphs occur in both style categories. The radiocarbon dates from 5MN2341 clearly are consistent with the early dates for the Abstract Tradition and the Uncompahgre Style and suggest that the rock art may have beginning dates which are even earlier.

Because of the extreme abstraction of the petroglyphs at 5MN2341, they are probably most accurately designated as a local manifestation of the Abstract Tradition. However, in the literature, the Abstract Tradition has generally not included grooves. This probably is a result of research which has tended to assume that grooves are the end products of activities such as tool modification (Feyhl 1980) or due to the consideration of rock art with grooves as stylistically separate from pecked and other petroglyph types which may be related (Heizer and Baumhoff 1962:208-209).

Highly abstract incised and ground elements are included in the Uncompahgre Style where they often occur in combination with pecked elements. The incised and ground rock art and associated forms such as pawprints and bird tracks probably comprise a substyle related to the widespread and long-lived tradition of making abstract rock art by peoples living an Archaic lifeway. Another possible substyle features rows of quadrupeds, and another combines anthropomorphs with abstracts and/or quadrupeds. In some cases grooves in Uncompahgre Style rock art appear more recent than associated pecked elements, based on patination levels and superimpositions, while in others they appear contemporaneous with or earlier than pecked elements.

The rock art at 5MN2341 generally falls within the Uncomphagre Style category as presently understood, and, as noted above, the proposed dates for the Uncompahgre Style include the estimated time period for rock art at 5MN2341. Petroglyphs at 5MN2341 are clearly related to petroglyphs at other west-central Colorado sites which exhibit Uncompahgre Style rock art.

Related Sites

Two prehistoric sites described in the literature have ground and incised petroglyphs similar to those of 5MN2341 and also occur in association with rockshelters located on the eastern slope of the Uncompahgre Plateau. Both sites are related to the Uncompahgre Complex artifactually and chronologically. The chronologies of the sites include the dates estimated for 5MN2341. The two sites are 5MN2 (Buckles 1971:Figures 147, 168) and the Moore Shelter (Wormington and Lister: 1956:8-9).

Rock art at 5MN2 is illustrated by Buckles but not discussed in detail. There are petroglyphs exhibited on the bedrock rear wall of the rockshelter which are ground and incised. These grooves are in four groupings which include elements also found at 5MN2341. Among the elements are individual grooves, "one-pole ladder" designs, possible bird tracks and fan like groove patterns.

Artifact assemblages from 5MN2 are proposed by Buckles to have possible chronological relationships with phases of the Uncompahgre Complex identified from sites elsewhere on the Uncompahgre Plateau. The phases are Shavano, Roubideau, Horse Fly, Dry Creek and Ironstone which are dated between 3500 B.C. and 0 A.D (Buckles 1971:1185,1300).

The Moore Shelter is a type-site for the Uncompahgre Complex and exhibits petroglyphs on the bedrock rear wall which include incised and ground grooves and stylized bear pawprints which are composed of grooves and pecked or ground pits. While there are no specific dates offered for the Moore Shelter, the Uncompahgre Complex was proposed by Wormington and Lister (1956:81) to date from the first few millenia B.C.

There are interesting points of similarity between the Moore Shelter and 5MN2341 in addition to the general location, rock art type and occurence of lithic flakes possibly used for the manufacture of grooves (as discussed above). First, the sites occur in close proximity to one another and, second, both sites exhibit rock art on rear shelter walls as well as on interior slabs of stone.

The Moore Shelter is approximately two miles from 5MN2341. A stone slab decorated with grooves on the floor of the rockshelter is described thus: "There was also a large rock which had apparently slipped from the back wall, about 2 feet above, and had fallen on the deposits with the same face still exposed. On it was a design 22 inches long and 14 inches high with appears to represent a conventionalized bird motif" (Wormington and Lister 1956:8). This situation raises some points of inquiry about the nature of Panel G at 5MN2341. Is the panel part of a stone slab which slipped from the back shelter wall prehistorically and, unlike that at the Moore Shelter, has since been covered by deposition, or is the panel directly from the rear wall or floor of the rockshelter which has not been exposed? Future excavation of the site should answer these questions and reveal any remaining rock art which can perhaps be temporally and culturally associated with early occupations of the site.

Summary

Incised and ground petroglyphs at site 5MN2341, the Harris Site, are associated with an estimated radiocarbon date of 2700 years ago. Based on relative stratigraphy at the site and the stylistic relationships of the various panels at the site, some of the petroglyphs could have even earlier times of manufacture.

It is likely that the petroglyphs at 5MN2341 were manufactured by either stone or bone tools. While the modification of tools may have been the intent of the artists in making some of the grooves, the present evidence indicates that the making of petroglyphs was the primary goal, and generally the grooves serve as lines such as those seen in pecked or scratched petroglyphs.

Stylistically, the petroglyphs at 5MN2341 may be classified as part of the generalized Uncompahgre Style which is attributed to hunter-gatherers who have been archaeologically defined as part of the Uncompahgre Complex. Rock art and archaeological information from other Uncompahgre Complex sites is similar to that at 5MN2341 and can serve as useful comparative data. Beginning dates for the Uncompahgre Complex are prior to 5000 years ago, and it may have continued as late as A.D. 1300. Future research at 5MN2341 has potential for more precise dating of Uncomphagre Style rock art and more detailed associations with site occupations.

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Catalogue Number 45

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Catalogue Number 279

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APPENDIX B

GEOLOGY OF THE HARRIS SITE

by

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Prepared for

Chipeta Chapter
Colorado Archaeological Society
Montrose, Colorado

July 1988

INTRODUCTION

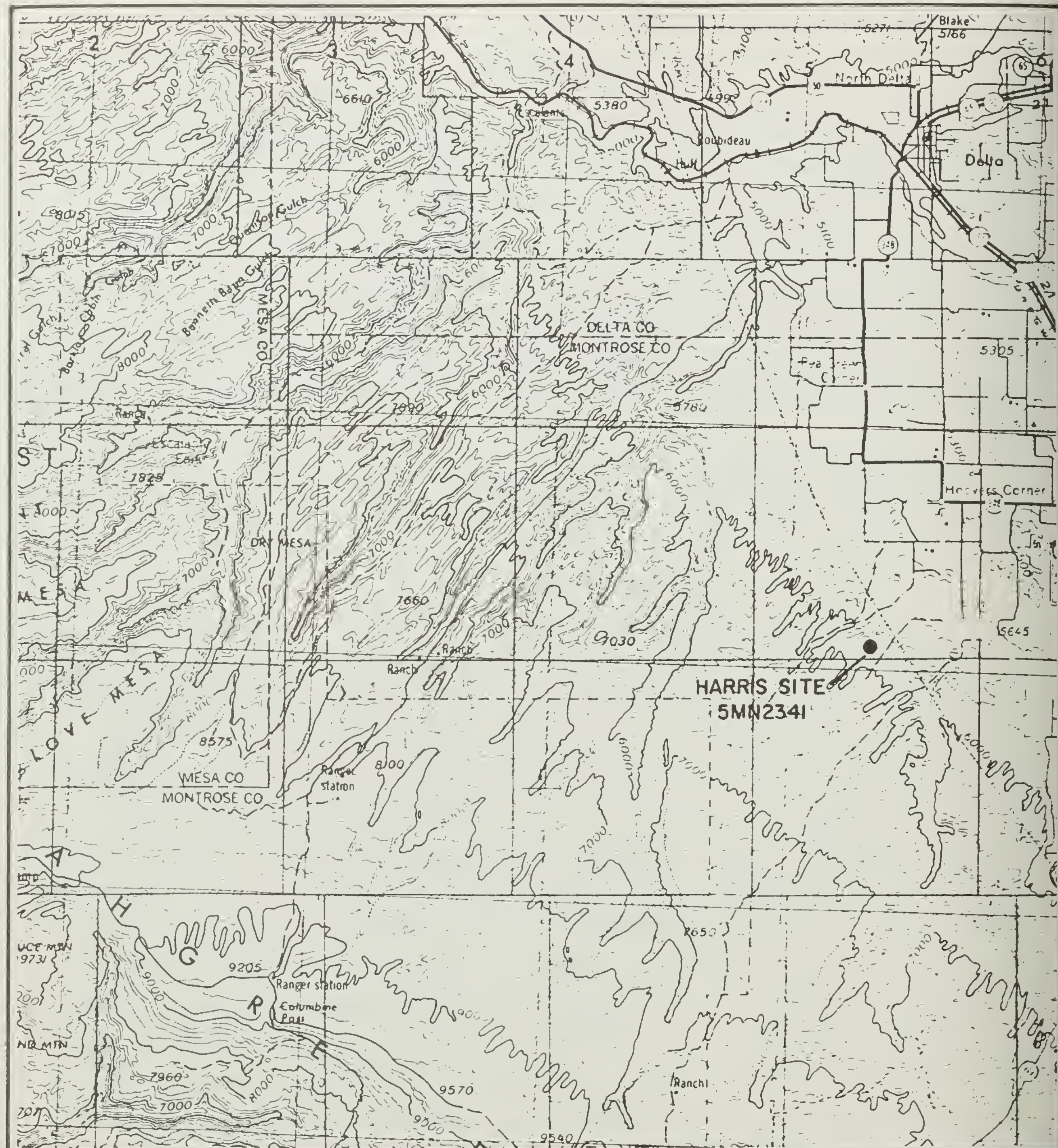
The Harris Site, 5MN2341, is located in a shallow alcove at the base of a sandstone escarpment and on a terrace above a small intermittent drainage. Cultural fill spreads out across the terrace from the alcove to the stream bank where it has been truncated by downcutting along the stream. Here the cultural material rests on a 50-centimeter-deep sequence of unconsolidated sands and gravels. A radiocarbon date obtained from just above the cultural/sterile contact provides a probable maximum occupational date of 4219 to 3469 years BP (before present, in years from 1950) (personal communication, Gordon C. Tucker Jr. 1988).

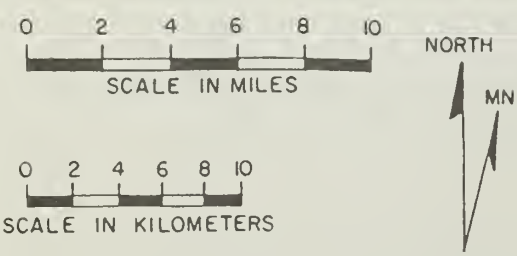
This report describes the site geology and attempts to place the site occupation within the sequence of depositional and erosional events.

GENERAL GEOLOGY

The Harris Site is located in a small intermittent drainage on the lower slopes of the east side of the Uncompahgre Plateau, a short distance above the valley of the Uncompahgre River (Figure B1). The outcrop of the Cretaceous Dakota sandstone controls the structural expression of the Uncompahgre Plateau. Regional dip of bedrock units is 2^{o} to 3^{o} to the northeast (Williams 1964). Where the resistant Dakota sandstone caprock has been removed by erosion, steep canyons are formed along the northeast-southwest trending drainages. Extensive downcutting has occurred along Roubideau Creek to the south and west of the Harris Site. Here downcutting by stream action has exposed the full sequence of underlying bedrock units. Underlying the Dakota sandstone in sequence from top to bottom are the Cretaceous Burro Canyon formation, the Jurassic Morrison, Summerville and Entrada formations, and the Triassic Chinle formation. The Chinle formation rests uncomformably on the Precambrian crystalline basement rock exposed along the deepest part of the canyon. Bedrock units of the Uncompahgre Plateau dip down into the Uncompahgre Valley. Here the Dakota sandstone is overlaid by the unresistant marine shales of the Mancos formation. Locally, the Mancos shale is capped by glacial outwash terraces along the Uncompahgre River (Williams 1964).

The Harris Site is located in one of a series of small intermittent drainages that drain a low, broad mesa. This mesa dips gently to the northeast into the Uncompahgre Valley and is bounded to the west and east by the canyons





Base Map: USGS Moab 1:250,000 quadrangle

Figure B1. Regional map showing location of the Harris Site.

of Roubideau Creek and Dry Creek. Surface expression of the mesa is controlled by the outcrop of the Dakota sandstone. Drainages along the mesa surface are formed by small intermittent streams, paralleling each other and flowing to the northeast. These streams are incised into shallow canyons in the Dakota sandstone and, locally, into the underlying Burro Canyon and Morrison formations. Big Sandy Wash, to the immediate north of the Harris Site, is dominated by a small fault and trends slightly more to the east (Williams 1964).

The surface of the mesa consists of Dakota sandstone outcrops and a shallow soil cover. Alluvial valley fill and wind blown sands are deposited along the canyon drainages. Colluvial wedge deposits and rockfall occur at the base of the steeper canyon rims.

QUATERNARY HISTORY

The topography of the Harris Site is a reflection of the Quaternary geomorphic history. During Pleistocene times, the Uncompahgre Plateau did not exist. Pre-Wisconsin glacial outwash from the San Juan Mountains was deposited on Mancos shale by the ancestral Gunnison and Uncompahgre Rivers flowing across what is presently the higher elevations of the present-day southern Uncompahgre Plateau. Uplift began at the Uncompahgre Fault along the west end of the Uncompahgre Plateau, and bedrock units were gradually uplifted and tilted to the northeast. As uplift occurred parallel to the courses of the rivers, the rivers began to gradually migrate to the northeast, downcutting through the less resistant Mancos shale to the surface of the resistant Dakota sandstone. Gradually the Dakota sandstone surface was scoured clean of the overlying Mancos shale and the Gunnison and Uncompahgre Rivers migrated to their present locations (Sinnock 1981a). As fluvial downcutting continued downslope, to the east at the Dakota sandstone/Mancos shale contact, the present-day consequent tributary stream pattern began downcutting into the newly exposed Dakota sandstone slopes. Stream flow patterns were largely perpendicular to the axis of uplift as reflected in the present-day northeast trending drainage pattern. Remnants of the pre-Wisconsin glacial tills are located near the upper end of Roubideau and Dry Creeks (Sinnock 1981a).

Wisconsing age glacial outwash is present as a series of four terrace levels along the Uncompahgre River. The terrace levels correspond with glacial stades, two of Bull Lake age and two of Pinedale age. The relative elevations and locations of the terraces correlate with the trend of downcutting and eastward migration of the Uncompahgre River. The oldest terrace level is the highest and is located west of the Uncompahgre River at the Mancos shale/Dakota sandstone contact at the foot of the Uncompahgre Plateau. The youngest terrace is lowest in elevation and is located adjacent to the modern river channel (Sinnock 1981b).

HYDROLOGY

The stream channel in the vicinity of the Harris Site is moderately incised and well confined by the Dakota sandstone canyon. Gradient is approximately 4 percent and sinuosity (the ratio of the channel distance over the direct linear distance) is on the order of 1.2. The stream bed is located on bedrock. The stream is flanked by alluvial terrace and colluvial deposits. No water was present at the times of investigation (October and December 1987, March 1988). The stream is classified as intermittent.

The drainage basin has an elevation high of approximately 2225 meters (7300 feet) and a low of 1725 meters (5660 feet) at the confluence with Big Sandy Wash. The drainage basin is elongated and narrow with a length to width ratio of 8:1. The drainage pattern is parallel. Approximately 1375 meters (4500 feet) above the Harris Site, the drainage becomes well confined by the Dakota sandstone canyon. Below the site, the drainage is less confined and the gradient decreases to 2.5 percent. The drainage is tributary to Big Sandy Wash to the north, which in turn is tributary to Dry Creek.

In the vicinity of the Harris Site, the channel is incised to bedrock and the apparent channel load during flow consists of a maximum size of cobble-size material. It is likely that the drainage responds mainly to storm activity and, to a lesser degree, seasonal runoff. At present, the stream is not a reliable water source. The feasibility of the stream as a water source during the period of occupation is discussed later in this report.

The possibility of groundwater seepage as a water source also exists. The Harris Site is located in an alcove formed by the erosion of a less resistant shale underlying massive sandstone. The shale layer was noted elsewhere within the drainage. The overlying Dakota sandstone is considered an aquifer. Groundwater would percolate throught the permeable sandstone to the contact of relatively impermeable shales. The direction of flow would be directed along the surface of the shale and emerge as a seep at the shale/sandstone contact. Recharge would occur as snowmelt and precipitation on the upland surfaces of the mesa. The area of recharge is relatively small and the resultant spring flow, if any, would be small. No springs currently exist within the vicinity of the Harris Site.

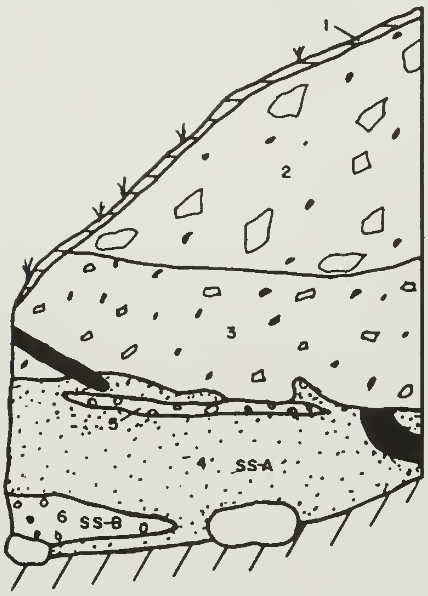
SITE GEOLOGY

The Harris Site is located at the base of the Dakota sandstone, in a small canyon formed by low sandstone cliffs. The alcove is located at the base of a massive south facing sandstone outcrop. Erosion of a thin lens of greenish, friable, very sandy shale located approximately three meters (10 feet) above the stream bottom resulted in the alcove formation. The interior of the alcove is filled with cultural material and rockfall debris; extensive digging by vandals has exposed the greenish sandy shale at the rear of the alcove. This shale was noted as a discontinuous lenticular unit in several locations along the drainage.

Cultural midden deposits spill down from the alcove to the stream channel. The midden deposits are a very fine silty sand with abundant charcoal fragments and angular sandstone cobbles. The hillslopes on either side of the midden are covered with colluvial slope wash and angular sandstone cobbles and boulders that have tumbled from the cliff above. Bedrock is exposed in the stream channel and consists of a coarse conglomerate typical of basal Dakota outcrops. The stream channel is incised into approximately three meters (10 feet) of alluvial valley fill. The valley fill at the Harris Site shows a rough gradation from coarse grained material at the stream channel level to finer grained material near the ground surface. A colluvial wedge of slopewash and rockfall debris covers the valley fill at the cliff base. Artifacts are found on the ground surface on each side of the stream channel indicating that a period of occupation occurred after fluvial deposition. The midden deposits are truncated by stream erosion. This may have resulted from stream bank erosion or from overall incision of the stream channel.

The stream channel is deeply incised in an irregular meander pattern. Cutbanks vary from very low to several meters high. A partial test unit (92N, 106E) was located along the north cutbank below the midden. The north wall of this test unit was profiled and the soils described (Figure B2). Two soil samples

PROFILE WEST WALL OF TEST UNIT



Soil Unit 1: Topsoil

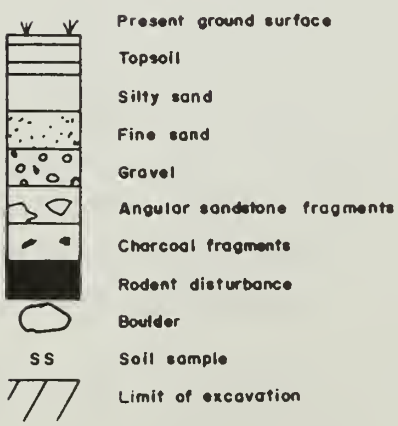
Soil Unit 2: Very fine silty sand with angluar sandstone cobbles; loose, friable. Numerous rootlets and charcoal fragments. Midden material.

Soil Unit 3: Silty sand with scattered angular sandstone pebbles, abundant charcoal fragments and caliche. Soil is mottled in color and disturbed by rodent and root activity. Possible eolian deposition with mixing of midden material.

Soil Unit 4: Fine sand; uniform, clean, friable. No apparent charcoal or cultural material. Possible eolian deposition or low energy fluvial or a reworking of deposits by both forms of deposition.

Soil Unit 5: Fine gravel stringer, friable. Indicative of moderate energy fluvial deposition.

Soil Unit 6: Gravel in sand matrix; rounded, loose. Moderate energy fluvial deposition.



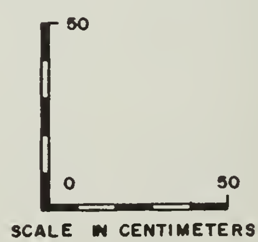


Figure B2. Profile sketch of Test Unit 92N, 106E showing soil units.

were taken for grain size analysis.

A soil profile was also described approximately 75 meters (250 feet) downstream from Test Unit 92N, 106E at the thickest sequence of alluvial valley fill. The soil profile description is provided in Figure B3. Two additional soil samples were taken for grain size analysis.

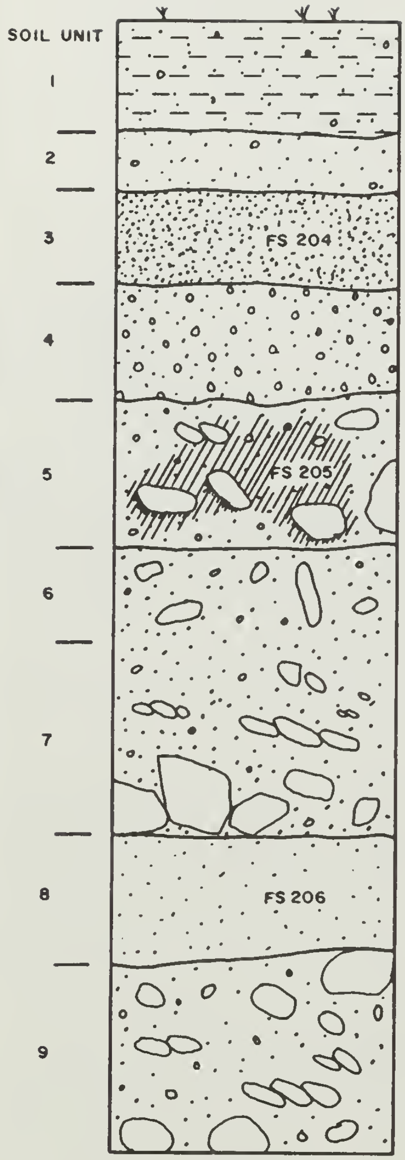
The soil profile contained no datable charcoal fragments. Several possible depositional events can be inferred from the stratigraphic column. Soil Unit 9 at the base of the profile represents a period of high energy fluvial deposition. The imbricated deposition of the larger-sized material attests to a high energy of deposition. The rounded to subrounded nature of the cobbles and gravels indicates fluvial transportation of some distance. The angular material noted is probably colluvial slope wash transported a short distance. Given the relatively small size of the drainage basin, this material was probably transported during flood events resulting from intense storm activity.

Soil Unit 8 probably represents a period of either channel migration or low flow activity. The uniform, well sorted, rounded snads of Soil Unit 8 suggest eolian deposition. This eolian activity might represent a dry climatic interval.

Soil Unit 7 suggests a return to high energy fluvial deposition although the angular nature of the cobbles and boulders suggests transportation of only a short distance. Soil Unit 6 is similar in nature but lacks the imbricated deposition of Soil Unit 7. The contact between Soil Units 6 and 7 is gradational, but the contact between Soil Units 7 and 8 is sharply defined suggesting a break in deposition and perhaps a period of stream incision. Together, Soil Units 6 and 7 suggest a fluvial deposition and reworking a colluvial slopewash deposits.

Soil Units 5, 4, 3, and 2 suggest a third depositional sequence. Soil Unit 5 represents high energy fluvial deposition similar to Soil Unit 9 with imbricated deposition of rounded to subrounded cobbles, gravels, and pebbles. Soil Unit 4 suggests moderate energy fluvial deposition with the deposition of a smaller grain size. The fine uniform texture of the sands in Soil Unit 3 suggests eolian deposition. The presence of rounded pebbles in Soil Unit 2 suggests a return to low energy fluvial. The sequence demonstrated by the soil unit interval is one of high energy fluvial reworking and transportation of the colluvial slope wash deposits of Soil Unit 6 grading into a period of less intense storm activity and moderate to low energy fluvial deposition and eolian deposition.

SOIL PROFILE



Soil Unit 1: Topsoil, fine sand with rounded pebbles; dense, hard. Some cementation by caliche.

Soil Unit 2: Fine sand with rounded pebbles; loose, friable. Sand grains are subrounded quartz; probable low energy fluvial deposition.

Soil Unit 3 Very fine sand; dense, hard, uniform texture. Sands are subrounded quartz grains, uniform in grain size and well sorted. Possible eolian deposition.

Soil Unit 4: Pebble conglomerate in sandy matrix; loose, friable, permeable.

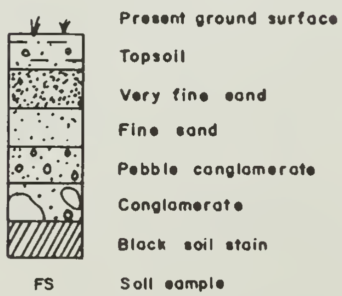
Soil Unit 5: Conglomerate, rounded to subrounded cobbles, gravels and pebbles in coarse sand matrix. Black staining is present as a coating on sand grains and underlying larger cobbles. Some overlapping of larger grain size material is present in the direction of stream flow. Fluvial deposition.

Soil Unit 6: Conglomerate, small angluar chert cobbles and boulders in a coarse sand matrix. No apparent bedding or overlapping of larger grain size material.

Soil Unit 7: Conglomerate, small angular chert cobbles and boulders in a coarse sand matrix. Cross bedding and overlapping of larger grain size material present. Sharply defined contact with underlying soil. Soil Unit 7 grades upward to Soil Unit 6. Probable high energy fluvial deposition.

Soil Unit 8: Fine sand; dense, dry, well compacted, uniform. Sands are subrounded quartz grains, uniform in color and texture.

Soil Unit 9: Conglomerate, rounded to subrounded cobbles, gravels, and pebbles in coarse sand matrix. Some low angle cross bedding and overlapping of larger grain size material in the direction of stream flow. Soil Unit is uniform in grain size distribution with some scattered angular shale and chert pebbles and cobbles. Probable high energy fluvial deposition.



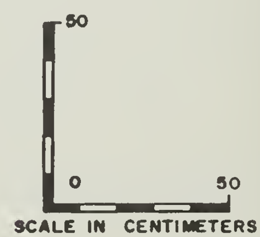


Figure B3. Soil profile description of alluvial valley fill near the Harris Site.

This depositional history is merely suggested by the interpretation of the soil profile sediments. No datable material was available to allow correlation of this depositional sequence to regional models. In addition, given the meandering nature of the present day stream, it is likely that channel migration took place in the past. The soil profile represents only a fraction of the channel cross section.

Correlation of the soil profile with Test Unit 92N, 106E is tenuous. Soil Units 2 and 3 of the test unit represent midden and disturbed midden. Soil Units 4, 5, and 6 suggest low to moderate fluvial deposition with reworking by eolian deposition. In the stream bank adjacent to and below the test unit and immediately overlying bedrock were high energy fluvial deposited rounded cobbles and boulders. A possible correlation between the sediments of Test Unit 92N, 106E and the upper five soil units of the soil profile exists. Both suggest a transition from high energy, storm related fluvial deposition to a moderate to low fluvial and eolian deposition.

SOIL SAMPLE ANALYSIS

Soil Samples SS-A and SS-B were taken from Test Unit 92N, 106E (Figure B2); soil samples FS 204 and FS 206 were taken from the soil profile (Figure B3). A grain size analysis was conducted by Grand Junction Laboratories and the results are attached to this report. The grain size data were plotted on a graph with cumulative percent retained on the vertical axis and grain size as expressed by phi (Ø) on the horizontal axis. The vertical axis represents the cumulative percent of the sample that would be retained at a given size interval. As the grain size decreases, a greater percent of the total sample would be retained. Grain size expressed as phi (Ø) is a logarithmic value of grain size that allows a wide range of grain sizes to be plotted on standard graph paper. A conversion table is given below:

Size in Millimeters	Phi (Ø)	Grain Size Description
.50	1.0	
.35	1.5	Medium sand
.25	2.0	
.177	2.5	Fine sand
.125	3.0	
.088	3.5	Very fine sand
.0625	4.0	
		Silt
.002	9.0	Clay

The grain size data plotted as cumulative percent retained are shown in Figure B4 along with the results of the statistical analysis conducted on the data. The median diameter (Md Ø or phi median), the average grain size, $\frac{\phi84 + \phi50 + \phi16}{3}$, and the sorting factor, $\frac{\phi84 - \phi16}{4.0} + \frac{\phi95 - \phi5}{6.6}$, were calcu- from the graph data. Values were obtained by determining the grain size for each soil type at the 95%, 84%, 50%, 16%, and 5% retained intervals.

The median diameter is the 50% interval and represents the point at which half of the grain size diameters are above that value and half are below. The phi median also provides an indication of the strength of the current of deposition. The larger the median diameter of the sediment, the stronger the current of deposition (Krumbein and Sloss 1963).

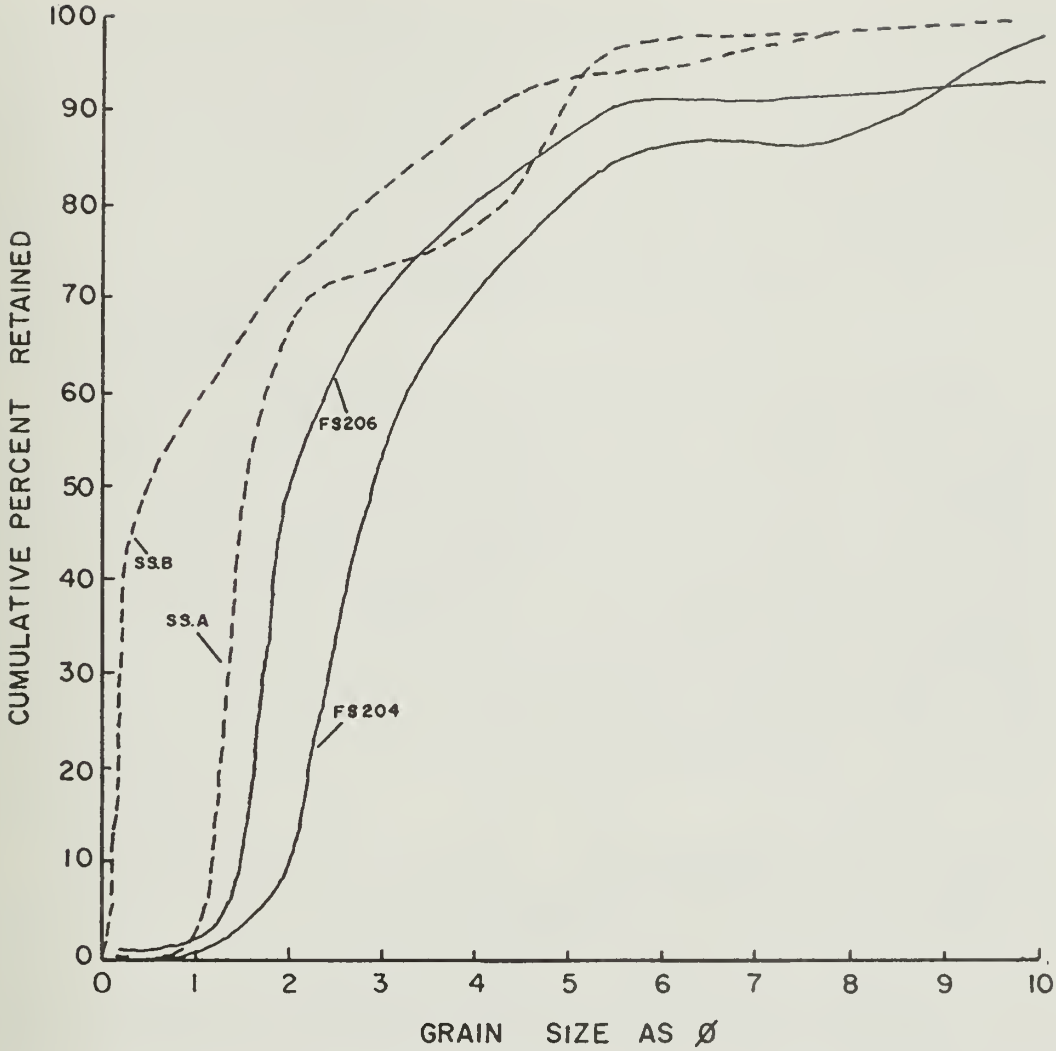
The average grain size is an average of the 84%, 50%, and 16% retained intervals and provides a more representative indication of the sediment grain size. The sorting factor provides a sensitive quantification of the degree of sorting. Well sorted sediments have a value of 1.0 or less, moderately sorted samples have a value between 1.0 and 2.0, and poorly sorted samples have a value of 2.0 or more (Mackey et al 1982). A well sorted sampled would contain a narrow range of grain sizes; a poorly sorted sediment would contain a wide array of grain sizes.

Mackey et al. (1982) investigated the correlation of sediment analysis with environments of deposition and provide a graphic framework for classifying depositional environments by statistical analysis of grain size. A number of sediment samples from various known present day depositional environments were taken and subjected to grain size analysis. The average grain size and sorting factor were calculated for each sample and plotted on a graph with the average grain size on the vertical axis and the sorting factor on the horizontal axis. The known samples tested tended to cluster, such that the graph could be divided into several zones representing environments of deposition (Mackey et al. 1981).

This graph is reproduced here as Figure B5. Sediment samples from the Harris Site are plotted on the graph and discussed below.

FS 204 Soil Analysis

The average grain size for FS 204 (Soil Unit 3, Soil Profile) is a very fine sand; the phi median is a fine sand. FS 204 is poorly sorted. The grain size curve indicates a tail in the direction of the finer grain sizes. The grain size curve shows a break from the Ø6 (0.15 mm) to the Ø8 (.004 mm)



RETAINED INTERVALS	SOIL PROFILE FS 204	FS 206	TEST UNIT 92N 106E SS A	SS B
Ø95	9.4	10.0	5.3	6.3
Ø84	5.4	4.8	4.6	3.3
Ø50	2.9	2.0	1.55	0.45
Ø16	2.1	1.55	1.2	0.1
Ø 5	1.6	1.3	1.1	0.1
Phi Median (MdØ)	2.9 (.14mm) fine sand	2.0 (.25mm) fine to med. sand	1.55 (.34mm) med. sand	.45 (.73mm) coarse sand
Sorting factor	2.0 poorly sorted	2.1+ poorly sorted	1.49 moderately sorted	1.74 moderately sorted
Average grain size	3.5 (.09mm) very fine sand	2.8 (.14mm) fine sand	2.45 (.18mm) fine sand	1.28 (.41mm) medium sand

Figure B4. Results of grain size analysis on sediment samples.

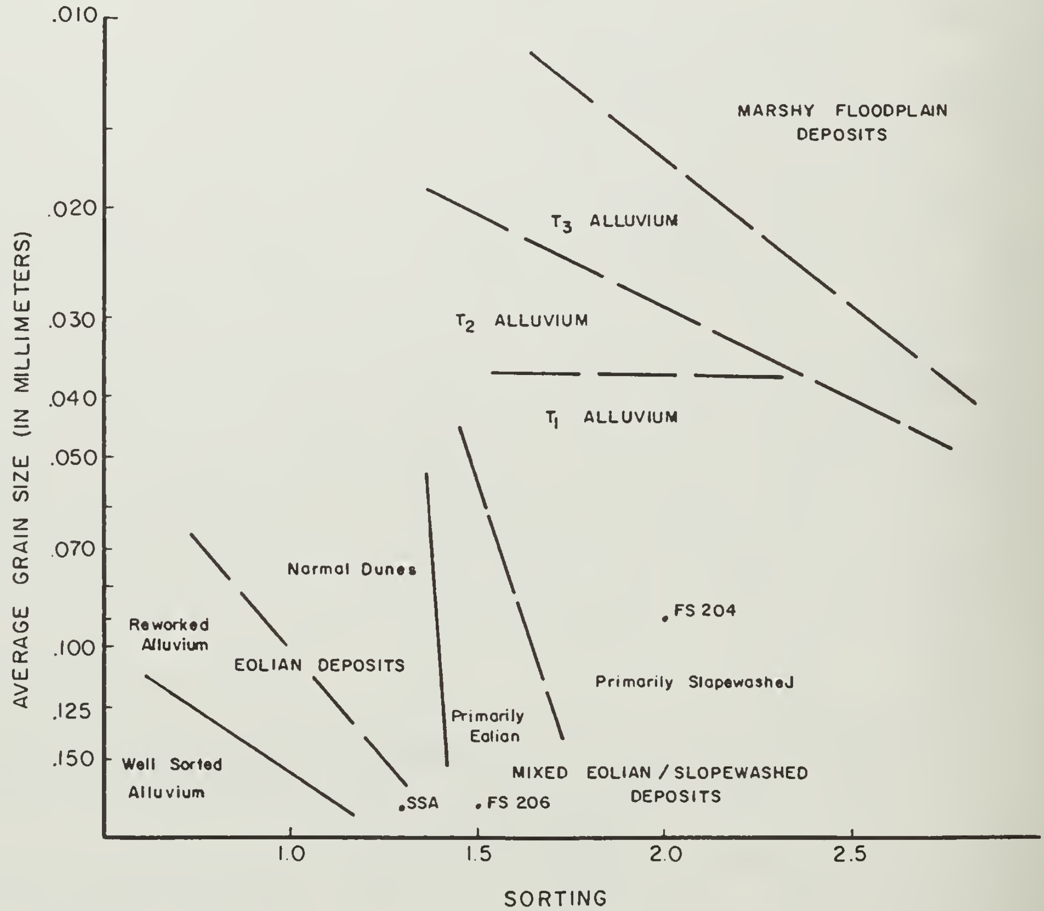


Figure B5. Graphic technique to classify depositional environments (from Mackey et al. 1981).

interval, possibly indicative of a winnowing out of silt size particles. The overall fine grain size of FS 204, along with its poorly sorted nature, suggests deposition and subsequent reworking by both fluvial and eolian means. The plotting of FS 204 as average grain size on a sorting factor indicates an environment of mixed eolian and slopewash deposits with some terrace alluvial influence. FS 204 likely represents a sediment that contains a mixture of wind and water transported, weathered Dakota sandstone.

FS 206 Soil Analysis

The average grain size for FS 206 (Soil Unit 8, Soil Profile) is a fine sand; the phi median is a fine to medium sand. FS 206 is poorly sorted. Although 50 percent of FS 206 is medium to coarse sand, the grain size analysis indicates a large percentage of silt and clay size particles. Plotting of FS 206 as average grain size on a sorting factor indicates a mixed eolian/slopewash environment of deposition. As discussed above, Soil Unit 8, from which FS 206 originates, might represent a dry climatic interval where colluvial deposition and eolian reworking of weathered Dakota sands were the primary agents of deposition.

SS A Soil Analysis

The average grain size for SS A is a fine sand; the phi median is a medium sand. SS A is moderately sorted. SS A contained less silt and clay than FS 204 and FS 206. SS A did have a break in the grain size curve from the Ø2 (.25 mm) to the Ø5 (.003 mm) interval indicative of a possible winnowing out of very fine sands. The plotting of SS A as average grain size on a sorting factor indicates an eolian deposition which correlates with the break in the grain size curve. The interbedded gravels present in the soil profile suggest a fluvial association. SS A probably represents low energy fluvial deposition with periods of exposure, possibly during stream migration.

SS B Soil Analysis

The average grain size for SS B is a medium sand; the phi median is a coarse sand. SS B is moderately sorted. The average grain size of SS B is too large to plot on Figure B5. The presence of rounded gravels in a sand matrix is indicative of a fluvial environment of deposition.

Although the grain size analysis of the sediment samples provided insight into the respective environments of deposition, there was no apparent correlation between the samples taken from the soil profile and from Test Unit 92N, 106E.

PALEOENVIRONMENT

The sediments present in the soil profile are indicative of a cyclic sequence of deposition. Environments of deposition represented include high energy fluvial, most likely resulting from intense storm activity; moderate to low energy fluvial, most likely from flows resulting from snow melt or groundwater recharge; and colluvial slopewash and eolian deposition, reflecting a drier environment. Unfortunately, no datable material was obtained and the age of the depositional events was not determined.

A general paleoenvironmental reconstruction is possible from the sediments present in Test Unit 92N, 106E. The sequence of sediments profiled are indicative of a low to moderate energy fluvial deposition with some reworking by winds. A low to moderate energy stream flow could possibly result from one or a combination of reasons: 1) stream recharge from groundwater seepage or springs, 2) snowmelt, or 3) precipitation. It is not known whether stream flow was intermittent or perennial. An overall increase in precipitation could result in an increase in snowpack, providing an increased groundwater recharge and an average larger runoff period in the spring. Groundwater discharge as springs or seeps would contribute to stream flow on a time delayed basis. Precipitation events during the warmer months would also contribute to stream flow. An overall increase in precipitation would also result in an increase of vegetative cover which, in turn, would reduce the flood severity from intense storm activity.

A general relationship exists between the mean annual precipitation and the mean annual sediment yield as a ratio of the mean annual water yield. Figure B6 illustrates that as the mean annual precipitation increases, the annual amount of sediment transported in the annual water yield decreases. This is a reflection of increased vegetative cover that would tend to retain intensive runoff and stabilize the ground surface (Knox 1983). The high energy fluvial depositional episodes noted in the soil profile may well have occurred during a relatively dry period with a sparse vegetative ground cover. Moderate to intense storm activity in a watershed with little productive vegetative cover would result in a rapid, high energy runoff carrying a large bedload. The low energy fluvial flow noted near the top of the soil profile probably reflects an overall moister climate that encouraged vegetative growth and ground cover.

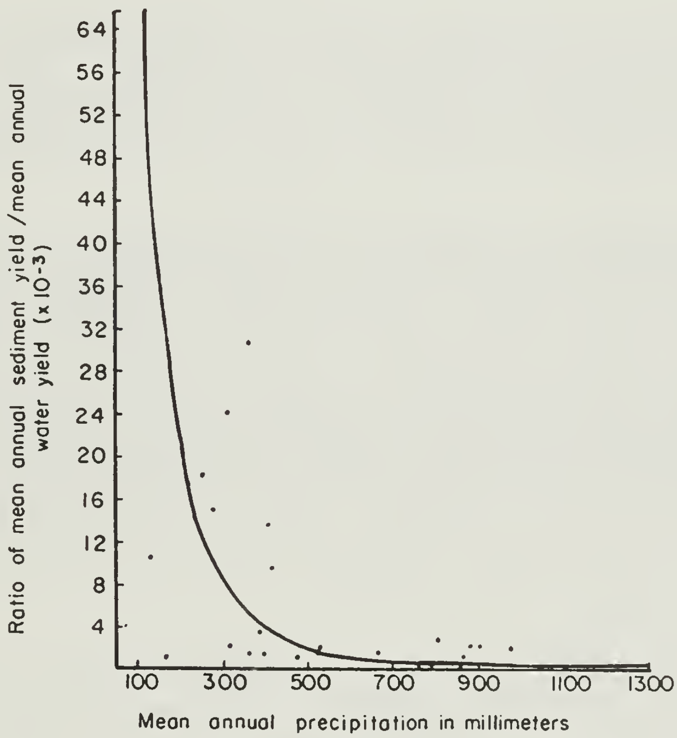


Figure B6. Comparison of mean annual precipitation and mean annual sediment yield (from Knox 1983).

The sediments noted in Test Unit 92N, 106E below the cultural midden suggest a moister climate with increased ground cover. Stream load consisted of sands and gravels. An increased vegetative cover would mute the intensity of storm runoff and decrease the depositional energy levels. Stream runoff from precipitation events would be less catastrophic and have a longer duration. Possibly ground water seepage extended the year-round water supply.

Since occupation of the site, the stream channel has undergone incision down to bedrock. The cause of this erosional episode is not known. Knox (1983) describes how a shift to a drier climate would initiate channel entrenchment:

> The widespread triggering of erosional episodes probably is the result of the onset of conditions that favor more frequent recurrences of moderate to extensive flooding capable of destabilizing a channel system. Bryan [1928] hypothesizes that minimal vegetation during dry periods resulted in increased surface runoff and large floods which initiated the channel entrenchment that ultimately expanded upstream through a drainage system (Knox 1983).

It is possible that a shift to a drier climate has resulted in an overall decrease of vegetative cover. Other possible reasons such as fire damage and land use practices such as intensive livestock grazing would also result in a decrease in vegetative cover.

The soil profiles examined in this investigation represent only a small fraction of the channel distribution, and the time frame provided by radiocarbon dating is quite limited. The study of the site was preliminary in nature and the conclusions drawn are hypotheses based on the information at hand. Further exploration at the Harris Site would be of benefit in the paleoenvironmental reconstruction.

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GRAND JUNCTION LABORATORIES

435 NORTH AVENUE • PHONE 242-7618 • GRAND JUNCTION, COLORADO 81501

ANALYTICAL REPORT

Received from: Nancy Lamm
Olathe, CO

Customer No. ______ Laboratory No. 0799 Sample soil

Date Received 3/1/88 Date Reported 4/7/88

Harris Site, March 1988
Sample

0799
SS1 site#5 MN2341 soil profile soil type 7 60cm below PGS bulk soil fine sand FS#204 12/12/87 Tucker

>2 mm		0 % pebbles
2 - 0.85 mm		0.178 % very coarse sand
0.85 - 0.5 mm		0.182 % coarse sand
0.5 - 0.25 mm		8.754 % medium sand
0.25 - 0.10 mm		52.55 % fine sand
0.10 - 0.053 mm		10.85 % very fine sand
0.053 - 0.020 mm	12.79 % +	
0.020 - 0.005 mm	0.82 % +	
0.005 - 0.002 mm	7.13 % =	20.74 % silt
<0.002 mm		6.72 % clay

Harris Site, March 1988
Sample

0800
SS2 FS 206 5MN2341 soil profile soil type 2 2.3 m below PGS bulk soil fine sand

>2 mm		0 % pebbles
2 - 0.85 mm		0.780 % very coarse sand
0.85 - 0.5 mm		0.185 % coarse sand
0.5 - 0.25 mm		48.13 % medium sand
0.25 - 0.10 mm		23.70 % fine sand
0.10 - 0.053 mm		8.34 % very fine sand
0.053 - 0.020 mm	7.42 % +	
0.020 - 0.005 mm	2.67 % +	
0.005 - 0.002 mm	0.53 % =	10.62 % silt
<0.002 mm		8.22 % clay

Lab Dir.: Brian S. Bauer

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ANALYTICAL REPORT

Received from: Nancy Lamm
Olathe, CO

Customer No. ______ Laboratory No. 0801 Sample soil

Date Received 3/1/88 Date Reported 4/7/88

Harris Site, March 1988

Sample 0801
SS3 5 MN2341 TU Westwall soil type 3
NBL 2/28/88

>2 mm			0 % pebbles
2 - 0.85 mm			0.933 % very coarse sand
0.85 - 0.5 mm			0.292 % coarse sand
0.5 - 0.25 mm			65.27 % medium sand
0.25 - 0.10 mm			7.98 % fine sand
0.10 - 0.053 mm			5.74 % very fine sand
0.053 - 0.020 mm	16.40 %		
	+		
0.020 - 0.005 mm	1.93 %		
	+		
0.005 - 0.002 mm	0.406 %	=	18.74 % silt
<0.002 mm			1.02 % clay

Harris Site, March 1988

Sample 0802
SS4 Harris site 5MN 2341 TU West Wall
TU near stream soil type 5 gravels NBL
2/28/88 bulk soil

>2 mm			0 % pebbles
2 - 0.85 mm			39.12 % very coarse sand
0.85 - 0.5 mm			19.60 % coarse sand
0.5 - 0.25 mm			14.22 % medium sand
0.25 - 0.10 mm			11.99 % fine sand
0.10 - 0.053 mm			6.375 % very fine sand
0.053 - 0.020 mm	2.492 %		
	+		
0.020 - 0.005 mm	4.376 %		
	+		
0.005 - 0.002 mm	0.00 %	=	6.868 % silt
<0.002 mm			1.77 % clay

Lab Dir.: Brian S. Bauer

APPENDIX C

Analysis of Historic Artifacts from the Ute Component of the Harris Site (5MN2341)

by

Jonathon C. Horn

On October 31, 1987, while setting the primary datum across the drainage from the rock shelter at the Harris Site (5MN2341), several blue and white seed beads were noticed in a nearby ant hill. Further examination of the area revealed more beads, the presence of a cartridge, a short length of light chain, and a few other historic artifacts. The beads, chain and cartridge were point plotted and collected. On December 7, 1987, the remaining historic artifacts, primarily cans, were point plotted and collected as well for further analysis.

The presence of seed beads suggested that the site may have been occupied by Utes. Drawn glass seed beads of the sort found were manufactured and distributed expressly for the Indian trade. Their small size and good quality indicate that they were manufactured between ca. 1840 and 1890 to 1910 (Sprague, personal communication 1987). The likelihood that they were deposited at the site by Euroamericans seems remote.

Analysis of the short length of chain appears to further substantiate a Ute affiliation for the component. The chain was one of several decorative lengths of chain attached to the sides and underside of a 19th century Spanish ring spade bit. A Spanish ring spade bit with identical chain decoration was recovered at 42UN1225 (Fike and Phillips 1984:49-53) and an identical length of chain was found at 5MT5393 (Chenault 1983:9,11,18). Both sites are historic Ute burials.

The .45-70 Government cartridge is the only concretely datable artifact from the site. The United States military adopted the .45-70 cartridge in 1873 for use in the single shot trap door Springfield rifle (Barnes 1972:63). Its headstamp - R W 4 79 -indicates that it was a 500 gr. rifle load manufactured by Winchester for the military in April 1879 (Bearse 1966:52). Therefore, it must have been deposited at the site some time after that date. The time it took to be distributed and finally fired is not known. However, if the individual who used the cartridge was Ute, as indicated by the beads and chain, deposition would have had to have been prior to the Ute removal late in 1881. The .45-70 cartridge suggests ownership of a Springfield trap door rifle by one of the site's inhabitants.

The remaining artifacts are five cans and a stamped sheet metal spoon. These are all of Euroamerican manufacture and appear to be contemporary with the other artifacts. Two of the cans are lead sealed hole-in-cap food cans with abundant lead, especially on the side seams. These are 3 3/8 inches in diameter, 4 9/16 inches tall and have 2 inch diameter filler holes. The lead sealed ends of both of these cans were opened with a knife to extract the unidentified contents. Two other cans were small, friction-top cans, similar to baking powder cans but smaller. These measure about 2 inches in diameter and are 3 3/16 inches tall. A raised bead encircles the can about 3/8 inch from the top which served as a stop for the friction top lid. The bottom and side seams of these were sealed with lead indicating that some perishable foodstuff may have been contained inside. The remaining can was oval in shape, measuring 1 3/8 by 3 3/4 inches and 4 inches tall, and appears to have had a 1 inch diameter spout of some sort attached to the top. It has flat seams top and bottom and a simple lock seam on the side. The seams were not sealed with lead. While the contents of this can are unknown, the can shape and size are reminiscent of one pound gun powder cans pictured in the 1902 Sears, Roebuck & Co. catalog (Sears, Roebuck & Co. 1902: 337) and 1895 Montgomery Ward catalog (Montgomery Ward & Co. 1895:476). The spoon is a large serving spoon with the handle broken off made of stamped sheet metal. It shows evidence of having been plated and had a capacity of one tablespoon.

The presence of the possible gun powder can indicates the presence of at least one other individual with a rifle, probably a muzzle loader. The other cans suggest some other possibilities. Use of canned goods by Utes would appear to indicate adaptation to non-traditional food sources. During the period of unrest and open hostilities after the Meeker Massacre, traditional food gathering practices may have been disrupted. Easily transportable foodstuffs, such as canned goods, may have been adopted, at least as a supplement to traditional supplies in response to the turbulence of the times requiring increased mobility and forcing attentions away from a traditional hunting and gathering way of life.

While the historic artifact assemblage from site 5MN2341 is fairly small, it is quite interesting for its variety, datability, and cultural implications. The presence of the seed beads, decorative chain, and the cartridge all point to a Ute cultural affiliation for the historic component. It is an established fact that the Utes were removed from the Uncompahgre Valley to Utah late in 1881, therefore it appeared that the historic artifacts at 5MN2341 were very likely the result of a Ute encampment dating some time between the middle of 1879 and the end of 1881, a period of only about 2 1/2 years. It is presumed that all of the historic artifacts surface collected from the site are contemporaneous and represent a single, short occupation.

Artifact Inventory

Catalog No.	Description
5	1 light blue and 1 white drawn seed bead
6	7 light blue and 3 white drawn seed beads
7	Decorative chain from Spanish ring spade bit
18	.45-70 Government cartridge
132	Stamped sheet metal tablespoon
133	Hole-in-cap food can
134	Friction-top can
135	Friction-top can
136	Hole-in-cap food can
137	Oval can (gun powder?)

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APPENDIX D

Macrobotanical Analysis for 5MN2341, the Harris Site

by
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April 1988

Introduction

Results of analysis of one flotation sample and two collections of charred wood from 5MN2341, the Harris Site, are presented. The flotation sample was collected from Level 7, a cultural level or feature noted in a stratigraphic profile cut. The wood specimens were collected from Level 8 of this profile and from Level 8 in a test unit located upslope from the profile cut. The macrobotanical remains were analyzed in order to identify botanical resources utilized in conjunction with the occupation of the site.

Processing and Analytical Methods

The flotation sample was processed using a simple water separation technique. The sample was measured prior to processing and was then poured into a three gallon bucket filled with water. The water and sample were gently agitated to help release organic material trapped within the soil matrix at the bottom of the bucket. The organic material, or light fraction, floating on the surface or in suspension was recovered by slowly pouring the water through a close knit polyester cloth suspended over a screened box. This method allows the water to drain off while retaining botanical material in the cloth. This procedure was repeated until the water was cleared of organic materials. The labeled cloth was stapled closed and hung to dry. The sediment, or heavy fraction, was hosed to remove the dirt. The remaining material was trasferred to a newspaper envelope and hung to dry.

The heavy fraction was analyzed by quickly scanning it for botanical remains that had not floated, as well as for bone or inorganic cultural material. In order to facilitate analysis of the light fraction, it was first poured through graduated screens (5.6mm, 2.0mm, 1.0mm, 0.5mm, catch pan) and then analyzed by size grade. Botanical remains were sorted and identified using a binocular microscope with a magnification power of 8x-40x. Botanical remains were identified and separated to the finest taxomomic level possible and their condition (i.e. charred) was also noted.

Results and Discussion

The results of analysis are presented in Table 1. Three taxa of plants were identified: Chenopodium sp. (goosefoot), Juniperus sp.(juniper), and an indeterminate genus of Dicotyledoneae (dicot). All of the botanical remains identified were charred. It is commonly believed that noncharred remains from open-air sites or unprotected contexts are contaminants because uncharred remains from such contexts do not preserve well in the archaeological record (Gasser 1982; Keepax 1977; Lopinot and Brussels 1982; Minnis 1981). Therefore, the charred condition of the remains identified tends to support their association with the use of the site.

The juniper and dicot wood are considered to represent fuel resources, although either could have been utilized for other purposes, such as construction materials, and somehow inadvertently charred. It is difficult to confidently support an economic association between site use and the presence of the three goosefoot seeds. This plant genera is well documented in the

Table D1. Results of Analysis

Taxa	Part	Provenience: 92N/106E Level 7 BS1	92N/106E Level 8 vegetal	95N/99E Level 8 vegetal
Chenopodium	seed	3		
Juniperus	wood	0.4g	0.8g	2.8g
Dicotyledoneae	wood	+		

Note: All remains are charred
g-gram(s)
+-less than 0.1g

ethnobotanical literature for its economic value, predominately used as a food source (Elmore 1944; Robbins et al. 1916; Stevenson 1915; Whiting 1939; Yanovsky 1936). Given the provenience of the seeds in a probable feature, it is possible that the seeds reflect the procurement of this plant. However, goosefoot is a pioneer plant type that readily inhabites disturbed areas, such as areas of human activity. Furthermore, it is a prolific seed producer and the seeds are easily dispersed. Because of these characteristics as a disturbance plant, it is quite possible that the seeds are not indicative of economic use. The seeds may only indicate the presence of this plant type around the site during the occupation and their accidental inclusion in a cultural context that resulted in their charred condition. If more samples from the site were collected and found to contain charred goosefoot seeds, then a stronger case could be made for the intentional procurement of this economic plant.

Summary

Analysis of one flotation sample and two collections of vegetal remains resulted in the identification of juniper and dicot wood and several goosefoot seeds. The charred condition of all of the remains tends to support an interpretation that these remains were associated with the use of the site and were economic resources, although the goosefoot seeds maybe intrusive. As could be seen in Table 1, the single flotation sample was not extremely productive. Nonetheless, contents of the sample suggest that there is potential for recovery of subsistence related data at this site and flotation sampling should be encouraged during future work at the Harris Site.

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APPENDIX E

POLLEN ANALYSIS AT THE HARRIS SITE (5MN2341), IN WESTERN COLORADO

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INTRODUCTION

The Harris Site is located in a small rockshelter on the east side of the Uncompahgre Plateau. A single radiocarbon date places occupation of the shelter and formation of a cultural midden before and after 3500 BP. Eight pollen samples were collected stratigraphically from midden deposits outside the shelter. An additional pollen sample was collected from the present ground surface outside the shelter to act as a control sample for interpreting the paleoenvironment. Pollen samples were analyzed to address the paleoenvironment at the time the shelter was occupied and the midden formed. In addition, it may be possible to identify elements of the midden representing subsistence activities at this site.

METHODS

The pollen was extracted from soil samples submitted by the Chipeta Chapter of the Colorado Archaeological Society from western Colorado. A chemical extraction technique based on flotation is the standard preparation technique used in this laboratory for the removal of the pollen from the large volume of sand, silt, and clay with which they are mixed. This particular process was developed for extraction of pollen from soils where preservation has been less than ideal and pollen density is low.

Hydrochloric acid (10%) was used to remove calcium carbonates present in the soil, after which the samples were screened through 150 micron mesh. Zinc bromide (density 2.0) was used for the flotation process. All samples received a short (10 minute) treatment in hot hydrofluoric acid to remove any remaining inorganic particles. The samples were then acetolated for 3 minutes to remove any extraneous organic matter.

A light microscope was used to count the pollen to a total of 100 to 200 pollen grains at a magnification of 430x. Pollen preservation in these samples varied from good to poor. Comparative reference material collected at the Intermountain Herbarium at Utah State University and the University of Colorado Herbarium was used to identify the pollen to the family, genus, and species level, where possible.

Pollen aggregates were recorded during identification of the pollen. Aggregates are clumps of a single type of pollen, and may be interpreted to represent pollen dispersal over short distances, or the actual introduction of portions of the plant represented into an archaeological setting. Aggregates were included in the pollen counts as single grains, as is customary. The presence of aggregates is noted by an "A" next to the pollen frequency on the pollen diagram.

Indeterminate pollen includes pollen grains that are folded, mutilated, and otherwise distorted beyond recognition. These grains are included in the total pollen count, as they are part of the pollen record.

DISCUSSION

The Harris Site is situated in a small intermittent drainage a short distance above the valley of the Uncompahgre River on the lower slopes of the east side of the Uncompahgre Plateau. This small drainage drains a low, broad mesa that dips gently into the Uncompahgre Valley to the northeast. The canyons of Roubideau Creek and Dry Creek bound the mesa on the west and east sides respectively. The alcove containing this site is located at the base of a massive south facing Dakota sandstone outcrop in a small canyon formed by low sandstone cliffs. Cultural midden deposits are noted along the slope from the alcove to the stream channel below. These fine silty sand deposits contained abundant charcoal fragments and angular sandstone cobbles, and have been extensively disturbed by vandals. Aboriginal rock art covers the back wall of the shelter, as well as the adjacent cliff face.

The Harris Site is located at the edge of the pinyon/juniper community (REA 1983: Figure 4-5). Dominated by pinyon pine (*Pinus*) and Utah juniper (*Juniperus*), this community also supports an understory of grasses including Indian ricegrass (*Oryzopsis* — a Gramineae). Sagebrush (*Artemisia*) areas are noted interspersed with the pinyon/juniper woodlands and support big sagebrush, black sagebrush, and rabbitbrush (*Chrysothamnus* -- a High-spine Compositae) (REA 1983: 4-10). Three other major vegetative communities are noted in the vicinity of the site and include the mountain shrub community that supports Gamble oak (*Quercus*), common serviceberry (*Amelanchier* -- a Rosaceae), and mountain mahogany (*Cercocarpus* -- a Rosaceae); the saltbush (*Atriplex* -- a Cheno-am) and greasewood (*Sarcobatus*) community that includes shadscale (*Atriplex* -- a Cheno-am), saltbush, rabbitbrush, greasewood, broom snakeweed (*Gutierrezia* — a High-spine Compositae), and sagebrush; and the riparian community along creeks and rivers, whose main component is cottonwood (*Populus*).

Two radiocarbon dates are available from the Harris site, one of which may be correlated with the pollen record. An age of 3510 ±. 270 BP is reported for FS 244, which was collected from the same depth as pollen sample 250 in the same unit. The calibrated age range for this sample is 4219 - 3469 BP (2270 - 1520 BC).

Eight stratigraphic pollen samples were collected from cultural midden deposits and an additional sample was collected from the present ground surface as a control (Table 1). The pollen record from the present ground surface at this site reflects vegetation including a large quantity of shadscale and saltbush locally. The pinyon/juniper woodland community is overshadowed in the pollen record by the shadscale and saltbush (Cheno-am) pollen (Figure 1, Table 2). Gambel oak (*Quercus*) pollen occurs in small quantity, reflecting the presence of this shrubby tree. Sagebrush (*Artemisia*), serviceberry and mountain mahogany (Rosaceae), snakeweed and rabbitbrush (High-spine Compositae), ragweed (Low-spine Compositae), and a member of the potato/tomato family (Solanaceae) are all represented in small quantity in the pollen record. The sample from the present ground surface contains the smallest quantity of pinyon pine (*Pinus*) pollen observed in this record. The juniper (*Juniperus*) pollen is the largest quantity observed, suggesting that the balance between pinyon pine and juniper is different at present than it has been in the past.

TABLE E1
PROVENIENCE OF POLLEN SAMPLES FROM THE HARRIS SITE

Sample No.	Level	Depth in cm below pgs	Stratum Description	Pollen Counted
255		0	Present Ground Surface	200
252	IV	10	Cultural midden, moderately compact sand, numerous angular rock frags	200
251	IV	30	Cultural midden, moderately compact sand, numerous angular rock frags	200
250	IV	50	Cultural midden, moderately compact sand, numerous angular rock frags 3510 $\pm$ 270 BP	200
249	III	70	Compact sand, no charcoal, light yellow brown	200
248	II	80	Moderately compact gravelly sand, much charcoal, brownish yellow	200
247	II	90	Moderately compact gravelly sand, much charcoal, brownish yellow	200
246	II	100	Moderately compact gravelly sand, much charcoal, brownish yellow	200
245	I	115	Moderately compact sand, light yellowish brown, few bits of charcoal	200

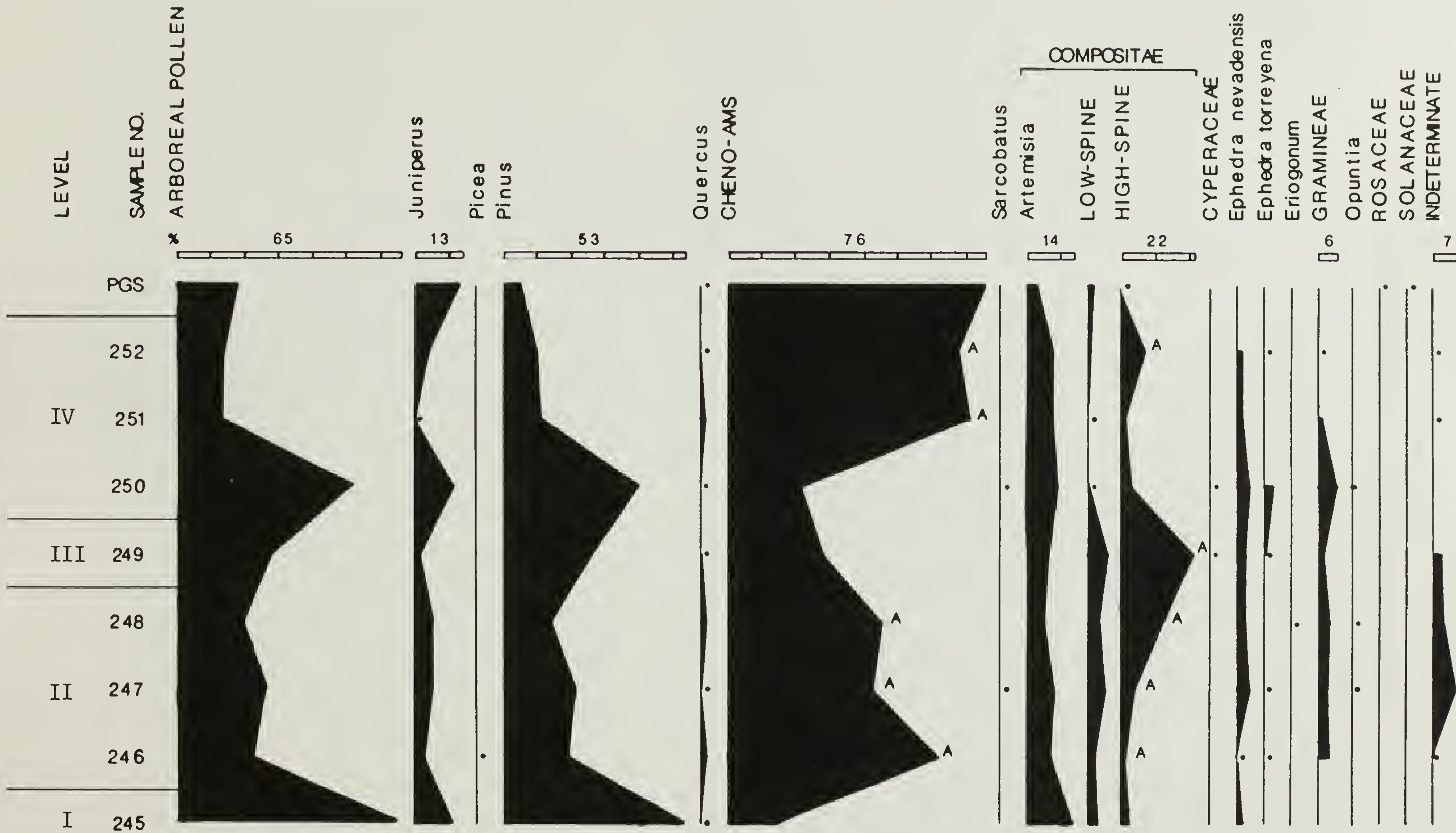

FIGURE E1. POLLEN DIAGRAM FROM THE HARRIS SITE

TABLE E2
POLLEN TYPES OBSERVED IN SAMPLES FROM THE HARRIS SITE

Scientific Name	Common Name
ARBOREAL POLLEN:	
Juniperus	Juniper
Picea	Spruce
Pinus	Pine
Quercus	Oak
NON-ARBOREAL POLLEN:	
Cheno-ams	Includes amaranth and pigweed family
Sarcobatus	Greasewood
Compositae:	Sunflower family
Artemisia	Sagebrush
Low-spine	Includes ragweed, cocklebur, etc.
High-spine	Includes aster, rabbitbrush, snakeweed, sunflower, etc.
Cyperaceae	Sedge family
Ephedra	Mormon tea
Eriogonum	Wild buckwheat
Gramineae	Grass family
Opuntia	Prickly pear cactus
Rosaceae	Rose family
Solanaceae	Potato/tomato family

The stratigraphic pollen column sampled extends considerably below the reported radiocarbon age of 3510 $\pm$ 270 BP at 46 cm. Without a basal date, it is difficult to assign a beginning time to this sequence. Stratum 1, the lowest stratum sampled in the midden, contained a few bits of charcoal, indicating association with human occupation. The single sample from this stratum (245) records the highest frequency of Pinus pollen in the record, indicating that pinyon pines either grew closer to the sampling location, or were generally more abundant in the vicinity of the shelter at this time. Cheno-am pollen is greatly reduced in this sample compared to most other samples in this record. Artemisia (sagebrush) pollen is slightly elevated. The pollen record suggests that this interval may have been cooler and/or more mesic than present, and similar only to conditions in evidence near 3500 BP at this site.

Stratum 2 is represented by three samples (246, 247, and 248). These samples display relatively low frequencies of arboreal pollen and elevated Cheno-am pollen frequencies. Cheno-am aggregates are observed in all three samples, indicating that a member of the Cheno-am group, such as shadscale and/or saltbush, or possibly herbaceous plants such as Chenopodium or Amaranthus, grew in the immediate vicinity of the site or on the midden itself. Artemisia pollen is observed in frequencies less than that recorded in Stratum 1, but greater than at the present ground surface. This suggests that sagebrush may have been more abundant in the local vegetation community than it is at present. High-spine Compositae pollen increases throughout this stratum, suggesting that the rabbitbrush and/or snakeweed populations were increasing. Aggregates of these pollen types were also recorded, indicating that rabbitbrush and/or snakeweed also grew in the immediate vicinity of the site.

Opuntia pollen is recorded in small quantity in samples 247 and 248 of this stratum. This may be as a result of the exploitation of prickly pear cactus as an element of the subsistence base, or the growth of prickly pear in the midden area. Prickly pear pollen may be recovered in small quantity in areas where it grows abundantly, but is usually not observed in the pollen record if it is an occasional element of the local vegetation. Abundance of prickly pear cactus in the local vegetation community would provide an excellent food source for exploitation by the occupants of the shelter.

Stratum 3 is represented by a single sample (249). This sample displays a slight increase in Pinus pollen accompanied by a decrease in Juniperus pollen. This suggests a shift in the composition of the pinyon/juniper woodland to one more dominated by pine. The Cheno-am pollen frequency declines in this sample, and the High-spine Compositae frequency peaks. This sample records the local peak in rabbitbrush and/or snakeweed population in the immediate vicinity of the shelter. A small quantity of Cyperaceae pollen was observed in this sample and may be present through long distance transport from a riparian community or the growth of dry habitat sedges with grasses at this site.

Stratum 4 is represented by three samples (250, 251, and 252), one of which is closely associated with the radiocarbon age of 3510 $\pm$ 270 BP (sample 250). Sample 250 displays the largest Pinus pollen frequency recorded since sample 245 of Stratum 1. This phenomenon is accompanied by a decreased Cheno-am frequency, and abruptly decreased High-spine Compositae frequency, and an elevated Gramineae frequency. These factors combine to indicate a cooler possibly more mesic interval at 3500 BP. In addition, the Opuntia pollen recorded in this sample is the highest observed at this site. This suggests that prickly pear was exploited by the occupants of the shelter, and the remains discarded in the midden. Alternatively, prickly pear cactus may have grown in abundance in the midden area. Again, a small quantity of Cyperaceae pollen is noted in sample 250, the lowest from this stratum, similar to that noted in sample 249.

The pollen record for the remainder of Stratum 4 (samples 251 and 252) record an abrupt decline in Pinus pollen accompanied by an abrupt increase in Cheno-am pollen, as well as aggregates of this pollen type. A single spike of High-spine Compositae pollen, accompanied by aggregates, is recorded in sample 252, indicating a short-lived increase in the rabbitbrush and/or snakeweed population. This portion of the pollen record appears to be indicating a decline in the density of the pinyon/juniper woodland and the onset of a warmer, drier environment, very similar to that of the present.

Evidence of possible subsistence activity in this midden is not abundant. Certainly the quantities of Cheno-am pollen observed in Strata 2 and 4 may be representative of some utilization of Cheno-am seeds and/or greens and the subsequent discard of remains by the occupants of the shelter. It should be noted that Cheno-ams include weedy annuals (Chenopodium and Amaranthus) that thrive in disturbed soil, such as exists in middens. This midden may have provided ideal conditions for the growth and exploitation of Cheno-ams if the shelter had been used seasonally on a regular basis. Cheno-ams are a group of plants that include the goosefoot family (Chenopodiaceae) and pigweed (Amaranthus) and were exploited for both their greens (cooked as potherbs) and seeds. The greens are most tender when young, in the spring, but may be used at any time. The seeds were ground and used to make a variety of mushes and cakes, and are usually noted to have been parched prior to grinding. Chenopodium and Amaranthus are both weedy annuals capable of producing large quantities of seeds, which may be harvested in the late summer and fall. Atriplex (saltbush), which occurs as both an annual herb and perennial shrub, may also be exploited for both its greens and seeds. Saltbush leaves have a salty taste and have been used as a seasoning. Saltbush seeds do not ripen until mid-fall and may remain on the shrubs throughout the winter into the next growing season (Chamberlain 1964:366; Gallagher 1977:12-16; Gilmore 1977:26; Harrington 1967:55, 57, 71; Rogers 1980:43, 66; Schopmeyer 1974).

Prickly pear cactus pollen is noted only in Strata 2 and 4, suggesting that the pads and/or fruit may have been collected and eaten. Opuntia fruits were a commonly exploited resource ethnohistorically. The fruits were eaten raw, stewed, or dried for winter use, and the pads were also peeled and roasted. The fruits may also be dried and ground into meal. The pads or joints of prickly pear cactus were boiled and eaten, frequently with syrup. The roots were also boiled to make a medicinal tea (Rogers 1980:61). In addition, the seeds may have been parched and ground into meal to be used to make mushes or cakes. The spines were frequently burned off both the fruit and pads in preparation for consumption Prickly pear fruits ripen during the summer and fall, whereas the pads may be harvested at almost any time of year. (Beaglehole 1937:70; Harrington 1967:24; Nequatewa 1943:18-9; Robbins et al. 1916:62; Stevenson 1915:69; Whiting 1939:85-6).

SUMMARY AND CONCLUSIONS

Stratigraphic pollen analysis of cultural midden deposits at the Harris Site displays evidence of fluctuating paleoenvironmental conditions. The earliest stratum (Stratum 1) yielded the largest quantity of Pinus pollen recorded at this site, suggesting an increase in the local pine population, possibly as a result of cooler and/or more mesic conditions. Stratum 2 produced abruptly diminished Pinus pollen frequencies, and greatly increased quantities of Cheno-am pollen. This may reflect warmer and/or drier conditions that resulted in the decrease of the pine population and increase in saltbush and/or shadscale in the vicinity of the site. Alternatively, the increased Cheno-am pollen may reflect, at least in part, the exploitation of Chenopodium (goosefoot) and Amaranthus (pigweed), weedy annuals that thrive in disturbed soils. Both of these weedy annuals and saltbush produce edible seeds that may have been collected and processed by the inhabitants of the rockshelter.

Similar paleoenvironmental conditions continued into Stratum 3, where the major change in the pollen record was the peak in High-spine Compositae pollen, which may reflect increased rabbitbrush and/or snakeweed at the site.

A change in paleoenvironmental conditions is indicated in sample 250, associated with a radiocarbon age of 3500 BP, when the Pinus pollen again increases dramatically, resembling the record in sample 245. Cooler and/or more mesic conditions are indicated in this portion of the pollen record. Above this level the pollen record indicates conditions similar to present. The large quantities of Cheno-am pollen in Stratum 4, accompanied by aggregates may represent, at least in part, the use and discard of Cheno-ams as part of the subsistence base. Small quantities of Opuntia (prickly pear cactus) pollen in Strata 2 and 4 may indicate that prickly pear cactus was collected and processed as part of the subsistence base by the occupants of this site.

A comparison of this pollen record with others from western Colorado yields numerous similarities. The cooler and/or more mesic interval noted at 3500 BP (2270 - 1520 BC) overlaps with cooler and/or more mesic intervals reported in the San Juan Mountains (Maher 1972), the Hurricane Basin in the San Juan Mountains (Andrews et al.), the La Plata Mountains (Peterson 1981), the DeBeque Rockshelter (Scott 1980), the Sisyphus Shelter (Scott 1985), Cowboy Cave (Lindsay 1980), and the Indian Creek Site (Horn et al 1987). In most cases this cooler and/or more mesic interval is followed rapidly by warming. The only exception is Cowboy Cave. The pollen record from the Harris Site is not sufficiently detailed above this point to identify further fluctuations. The cool interval reported by these various authors varies in length, beginning as early as approximately 4000 BC. A long cool interval is not suggested by the data at the Harris Site. Short-lived cool intervals are reported in the La Plata Mountains (Peterson 1981), and Sisyphus Shelter (Scott 1985). Correlation of these pollen records is presented in Figure 2. It is not yet possible to identify the length of the warm and/or dry interval that preceeds the cooler and/or more mesic interval at approximately 3500 BP, nor the time of the cooler and/or more mesic

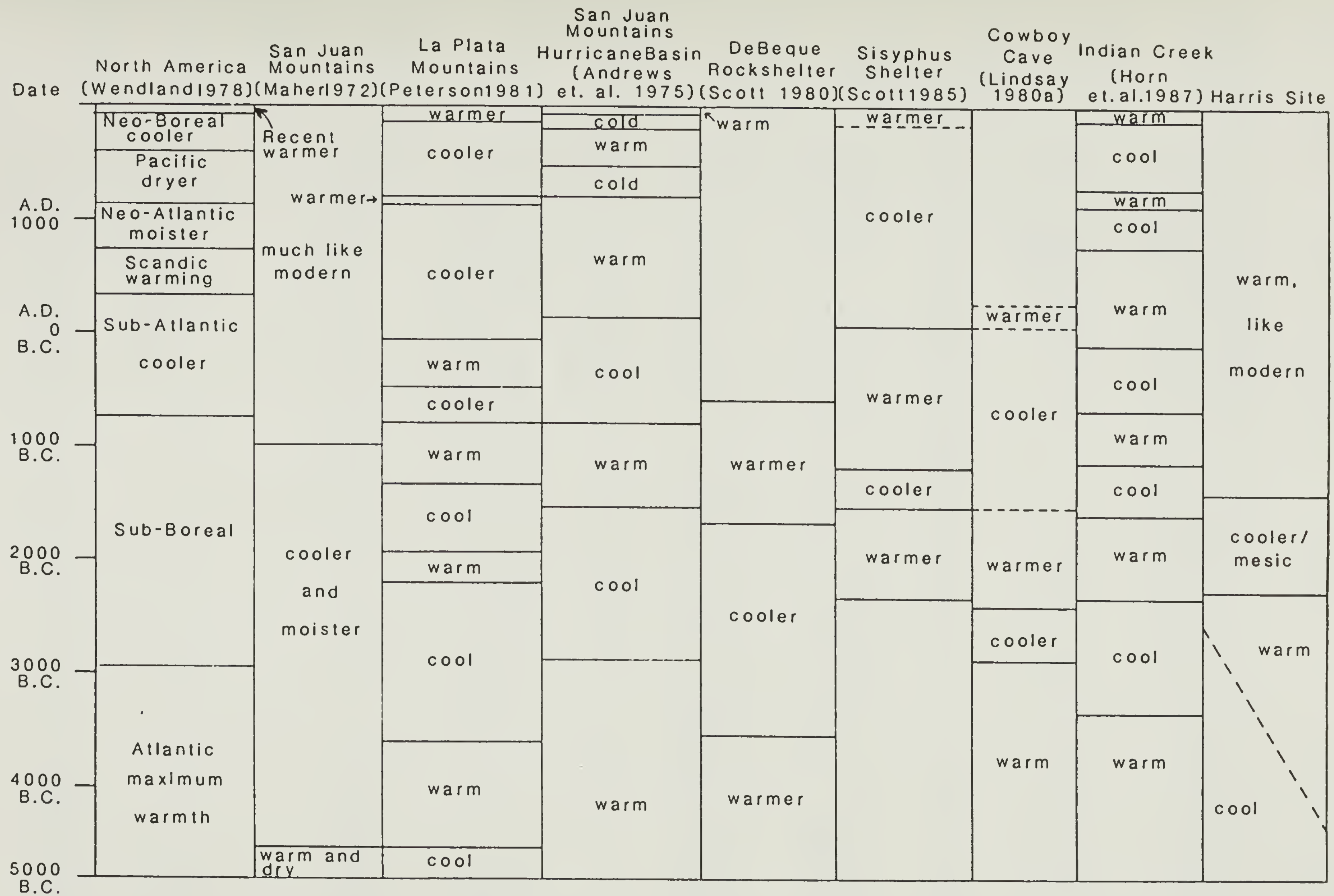

FIGURE E2. REGIONAL PALEOENVIRONMENTAL SUMMARIES.

interval associated with Stratum 1. Therefore, these intervals are presented by dashed, slanted lines.

The pollen record at the Harris Site yielded good preservation of pollen, and an excellent opportunity to examine pollen from this area. Additional work in this area should build on this pollen record to refine the paleoenvironmental interpretations.

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APPENDIX F

FAUNAL REMAINS FROM THE HARRIS SITE

5MN2341

by

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Report Submitted to the

Chipeta Chapter

of the

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INTRODUCTION

A total of 265 bones and bone fragments were submitted for identifications and analysis. Of this total, only 19 bones, or 7 percent of the total sample, could be identified to the genus level. Although this is a limited sample, some trends and patterns in the faunal assemblage can be observed. The bone which could not be assigned to formal taxonomic categories was assigned to general categories. Theses will be described in greater detail below.

Three genera were identified from the sample. Included are jackrabbits (*Lepus* sp.), cottontail rabbit (*Sylvilagus* sp.), and ground squirrel (*Spermophilus* sp.).

METHODOLOGY

The faunal material from the Harris Site was analyzed with several questions in mind. First of all, we wanted to establish which species of animals were present in the collection. For each bag of material, the author sorted the bone fragments into categories based in part on the "level of identifiability concept", as described by Lyman (1979). Basically, this approach allows the faunal analyst to obtain as much information as possible from all of the bone, whether it is identifiable or not. The categories used in this analysis include:

Unidentifiable - these small fragments of bone which cannot be further identified into any category.

Unidentifiable mammal - these are fragments of bone which cannot be further identified; however, we can tell they are mammal bone.

Unidentifiable medium-sized mammal - these are fragments which cannot be specifically identified; however, we can establish a general size class of mammal for the specimen. In this analysis, medium-sized mammals are the size of rabbits and hares.

Unidentifiable large mammal - these are fragments of bone which are from larger animals, deer size and larger.

Once the bone which could not be identified further were counted and listed on analysis sheets, those bones which could be identified further were analyzed. Bones which could be identified generally have a complete or partial articular end or other diagnostic feature which allows for certain identifications. In this collection, all of the bones which were identified to the generic level have intact articular surfaces. These elements were compared to known species in the author's comparative collection. In each case, the portion of the bone and its condition were noted on the analysis sheets. If any cut marks or burning were indicated, these too were noted. Table F1 presents the results of this analysis.

Table F1. Faunal Material from the Harris Site

Category	NISP[a]	Burned	MNI[b]	% of TOTAL	% of I.D. Bone	% of Cat. Bone
Sylvilagus sp.	12	1	3	4.5	63.2	-
Lepus sp.	6	0	2	2.3	31.6	-
Spermophilus sp.	1	0	1	0.4	5.2	-
ID Bone Subtotal	19	1	6	7.2	100.0	-
Unidentifiable	8	4	-	3.0	-	3.2
Unid. Mammal	170	67	-	64.2	-	70.2
Unid. Med. Mammal	37	21	-	14.0	-	14.3
Unid. Lg. Mammal	31	6	-	11.7	-	12.3
TOTALS	265	99	6	100.0	100.0	100.0

[a]NISP = Number of Identified Specimens

[b]MNI = Minimum Number of Individuals

IDENTIFIABLE BONE

As indicated by Table F1, the remains of the cottontail rabbit (Sylvilagus sp.) represent the most common animal identified from the Harris Site. The Desert cottontail (S. Audubonii) and Nuttall's cottontail (S. nuttallii) are common residents in the area of the Harris Site (Armstrong 1972). With the limited osteological material from the site, further identification beyond the genus level would be questionable. Cottontail remains constitute over 63 percent of the identifiable sample. The presence of one burned cottontail scapula from Unit 95N/100E, Level 9 clearly indicates the use of this animal as a food species. A MNI of three individuals, based on the presence of three right scapulas from the collection, is indicated for the site.

Six bones assigned to the genus Lepus were recovered from the Harris Site. Two individuals, based on two right distal humerii are represented. Although the site area is marginal for the black-tailed jackrabbit (L. californicus), identifications beyond the genus level would be questionable. The specimens from the Harris Site compare most favorably with the white-tailed jackrabbit elements in my collection; however, the possibility exists that these bones are from the black-tailed species.

Following Armstrong (1972), the rock squirrel (S. variegatus) and the golden-mantled ground squirrel (S. lateralis) are present in the Harris Site vicinity today. The single specimen from the Harris Site is a distal humerus and compares most favorably with the golden-mantled squirrel in my collection. However, without further materials from the site, it would be questionable to push the identification beyond the genus level.

UNIDENTIFIABLE BONE

Clearly, most of the recovered bone from the Harris Site could not be identified. This bone is highly fragmented, but overall bone preservation is good. The burned, splintered bone indicates marrow extraction and possibly bone grease production. The splintered, fragmented nature of the bone could be the result of canid activity; however, since much of this bone is burned, cultural activity is strongly suggested. No specific canid gnawing was observed on any of the Harris Site bone.

SUMMARY

The faunal material from the Harris Site is highly fragmented and much of the collection, nearly 40 percent, is burned. Marrow extraction and possibly grease production is suggested by the nature of the collection. No climatic differences are indicated by the identified fauna from the site; however, the three genera identified from the site could not safely be identified to the specific level.

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